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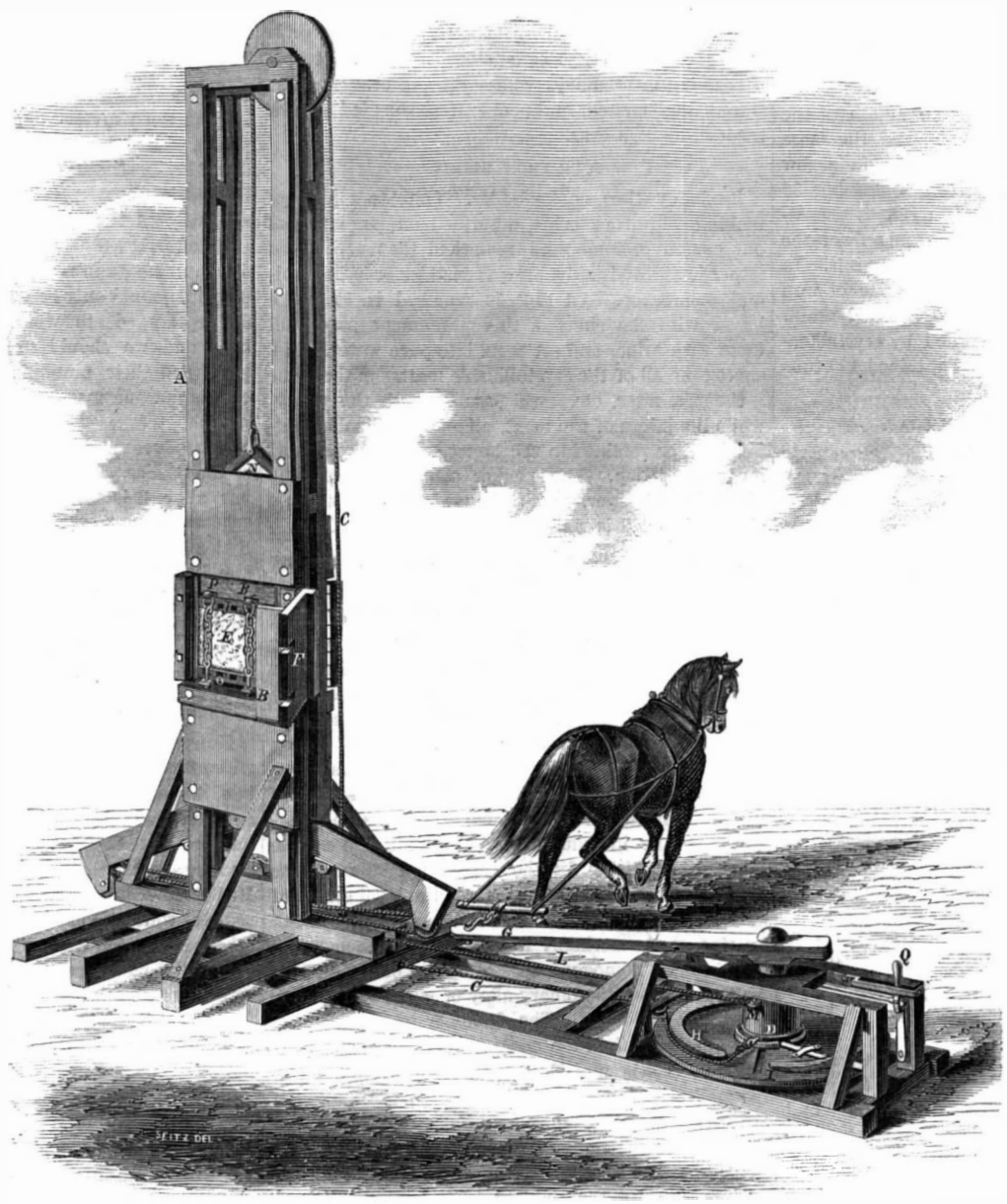
## Improved Beater Hay Press.

This press is one of a class wherein the hay is beaten before it is finally compressed by the action of a drop, so that the operation of pressing is rendered much more effective than in ordinary presses. The machinery consists of a tall upright frame, A, in which the drop, B, slides. This drop is raised by a rope, C, attached to the windlass, D (in a manner hereafter described), and rove through pulleys in such a way as to run easily. The hay to be pressed is introduced to the box the bale, E, is in; the doors, F, are then shut and held by strong fastenings; the team attached to the bar, G, then travels around, thus elevating the weight. The rope coils up on the rim, H, which is so made that when the weight reaches the top the rope has arrived at an inclined plane, I, where it runs or slips off the rim, H, and the beater or weight falls on to the batten, J, placed over the bale. This operation is repeated four or five times, until the hay is well consolidated; it is then ready for pressing. To effect this the team is called into requisition again, and the capstan, D, is thrown out of connection with the base the rim, H, is on, so that the latter is stationary—the rope being connected to a loose band that slips on the capstan body as it turns. The line, L, that works the toggle joints is tied to the lug, M, on the capstan, and as the latter is worked the joints draw together and compress the hay, during which operation the batten, J, serves for a follower, and the toggles, N, on the beater block are pushed down so as to throw two strong side-blocks into recesses in the upright frame, A, so that the bale cannot give. This operation compresses the bulk into about 24 inches square. By the arrangement of the battens, J and O, above and below the bale, the operator is enabled to band it before removing it from the press. This is done by slipping two strong clamps into the openings in the battens, D; the clamps are provided with chains and T-headed swivel bolts, so that the clamp straps can be quickly connected without screwing or unscrewing nuts. So soon as these clamps are attached the bale can be removed and banded properly on the ground with hoops while another bale is being compressed. There is also a brake and lever at Q, which enables the sleeve or capstan body to be held at any part of its revolution, either to adjust parts or to suspend the movement altogether. A patent was granted on this press to Ira James, of Mattoon, Ill., on the 16th of Feb., 1864. For further information address the patentee as above.



JAMES'S BEATER HAY PRESS.

## A New Alloy.

A new alloy, described as applicable to the manufacture of all metal articles, bells, hammers, anvils, rails, and non-cutting tools, has been patented by Mr. M. H. Micolon, of Paris. The alloy consists of iron with manganese or borax. The patentee takes 20 parts of iron turnings or tin waste, 80 parts of steel, 4 parts of manganese, and 4 parts of borax; but these proportions may be varied. When it is desired to increase the tenacity of the alloy, 2 or 3 parts of wolfram are added. When the cupola is ready, the iron and steel are poured in, and then the manganese and borax; finally, the vessel is filled up with coke; the metal is thus in direct contact with the fuel in the cupola, and by quickly running the fused mass into molds, bells which possess the sonorousness of silver, whilst the cost is less than bronze, may be obtained.

## Split and Sawed Shingles.

A correspondent of the Boston *Cultivator* says:—"I have been interested in the communications of your correspondent in regard to shingles. I have had over thirty years' experience in building and repairing roofs. I have taken rifted pine shingles from off several roofs that were worn entirely through at the line where the water falls from one shingle upon the next one below, while underneath the courses the shingles were as bright as when first laid. Such is not the fact with sawed and cut shingles, from any kind of timber. The reason is, that sawed and cut shingles are cross-grained, so that water runs through the pores of the wood—wets the under course, and, in wet seasons, seldom if ever dries. The agents of decay are air, water and heat. All are combined on a roof to produce decay, and you see the effect on all roofs made of sawed or cut shingles. I have replaced many roofs of sawed shingles, but they never were half worn; they were rotten and unfit to remain longer. Let any one examine a sawed shingle and he will find the grain severed, and every pore through which the sap was pumped up from the roots to the branches, is a water-pipe to conduct water through the shingle instead of over it, as is done by a rifted shingle. I advise every man, who has means to procure a rifted and shaved single, never to use a sawed or cut one. I think slate is the most economical and durable of all roofs. Tin will do well, and roofs with it will be laid more flat, thereby making less surface to cover. There may be compositions that will make good roofs, but I know of none I would accept as a gift, and I have tried several kinds. In choosing rifted shingles, don't get those of twisted grain, so that one side will turn up and the other turn down. Any person who will discover a cheap kind of roofing that will endure our variable climate, will deserve the everlasting gratitude of his kind. But forever deliver me from sawed, and more especially cut shingles."

In order to answer fully all the inquiries addressed to us upon the manufacture of turpentine, we have had an illustrated article prepared, showing the whole apparatus and process necessary for the purpose. The whole will appear in an early number of our new volume.

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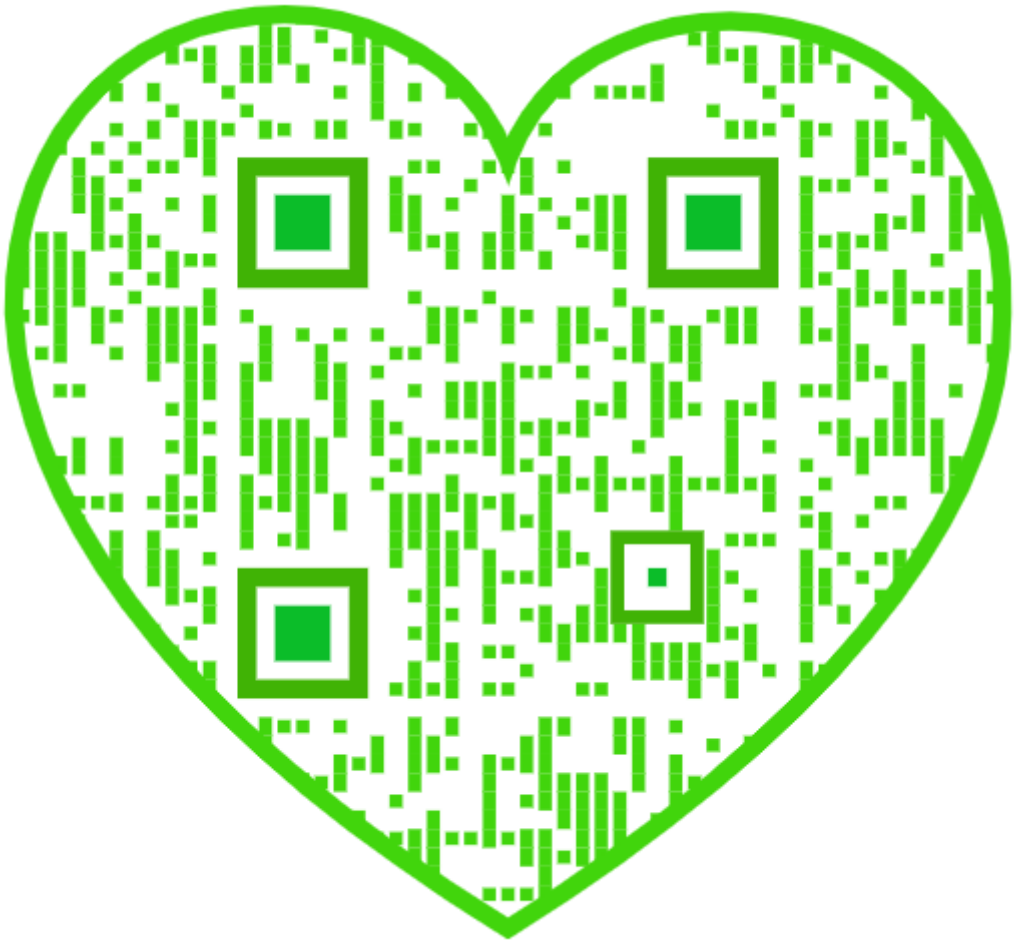

## UTILIZATION OF WASTE PRODUCTS.

At the last meeting of the Polytechnic Association the regular subject for discussion was the utilization of waste products, and Prof. Joy, of Columbia College, being called on by the President, made the following remarks:—

### WASTE FROM GAS-WORKS.

Constant progress has been made in the utilization of the waste substances produced in the manufacture of illuminating gas. At one time the companies paid persons for carting away the lime used for purifying the gas. The lime absorbs bisulphide of carbon, sulphureted hydrogen, and sulphur, coming from the distillation of the coal, and when exposed for a long time to the atmosphere it absorbs oxygen and becomes the sulphate of lime or plaster. This is now understood by a sufficient number of farmers to make a demand for the waste lime at a moderate price.

Mr. Cleland, the director of the Liverpool gas works, states that he has largely reduced the cost of purifying gas by using oxide of iron, and saving the sulphur and ammonia. The material from the purifiers is heated to about a thousand degrees Fah. in a close iron retort. A portion of the sulphur combines chemically with the iron, while the balance is distilled over. As soon as the sulphur ceases to come over, the contents of the retort are drawn and moistened, and in this state exposed to the action of the atmosphere. The oxidation is rapid, and the mass glows unless frequently wet and stirred. In a few weeks a sulphate of iron is produced containing 30 to 40 per cent sulphuric acid. The salt is decomposed by passing the vapor of ammonia from the waste waters of the hydraulic mains through it. In this way sulphate of ammonia and an oxide of iron are obtained. The oxide of iron can be used again. The sulphate of ammonia is purified by crystallization. Mr. Cleland says that he has obtained 100 tuns of sulphur in this way.

### PREPARATION OF SAL-AMMONIAC.

About two per cent of ammoniacal gas water goes over with the tarry products and is collected at the end of the hydraulic main in cisterns. This was formerly a waste product, it is now saved and the greater portion of sal-ammoniac of commerce is prepared from it. In London alone 840,000 tuns of coal are consumed every year in the manufacture of gas. This yields about 37,000,000 pounds of gas water. The water is subjected to distillation in two retorts, the first of which is heated directly by the fire, and the second by the latent heat of the steam from the first. The steam and gas are passed through a worm to be condensed, and flow into a large leaden tank containing muriatic acid. Uncondensable gases pass out of the tank and are conducted through the fire, where the sulphureted hydrogen is consumed, into the chimney. The muriatic acid is saturated to neutrality, and requires very little further treatment for the formation of beautiful white crystals of sal-ammoniac. This sal-ammoniac is the starting point in the manufacture of the salts of ammonia, and can now be obtained in great abundance by the above method.

### OIL OF WOOL WASTED.

There is a great waste in our woolen manufactories of a valuable substance; that is, the oil of the wool. When wool has been thoroughly cleansed it is found to have lost thirty, forty, or in some cases as high as sixty per cent of its weight, and the most of this is oil—an excellent oil for some purposes, and especially for soap. There is an establishment in England that takes wool to cleanse for the oil; making no other charge for the work.

### OIL AND FAT FROM REFUSE COTTON, GLUE, ETC.

Edward Tonybee digests the refuse material in about half its weight of concentrated sulphuric acid contained in leaden vessels and warmed by steam. They are thus dissolved and the fat separated. After standing, the fatty acids collect on the top, and can be removed and further purified by distillation. To the residual solution sufficient finely-divided phosphate of lime is added to neutralize the sulphuric acid, and a valuable compost containing phosphates and nitrogenous matters obtained.

### LIEBIG AND WASTE SEWERAGE.

When I was last in Europe I talked a great deal with Liebig, who has contributed more than any other man to the utilization of waste products; it has been the principal labor of his life; he has invented many processes himself, and has directed the attention of the world to the subject. His great grief is the waste of fertilizing material in the sewers. He spoke repeatedly of the loss of this material which is going on in the city of New York.

### SLAG IN IRON FURNACES.

I also visited Mantsel, where Luther went to school 300 years ago, and saw the iron mines in which Luther's father worked. At this place the slag has accumulated in mountains. People are constantly at work, you may be sure, at plans for extracting something of value from the waste slags. At Mantsel the slag is now run into molds of about a cubic foot each, and distributed to the workmen. Each man takes his share of the blocks in an iron wheelbarrow and wheels them home, when they still contain heat enough to cook the meal for the family. After they are cooled these rectangular blocks are an excellent material for building walls.

### ZINC WASTED IN GALVANIZING IRON.

A large portion of the zinc used for coating iron is evaporated and lost. Plans for preventing this loss are worthy of the attention of inventors. The whole history of zinc is that of a waste product. It was first found in chimneys where ores of other metals were being smelted, and people were thus led to seek for it in its own ores.

### SOUP FROM BRINE.

Prof. Joy then spoke of Mr. Whitelaw's plan of making soup from brine, described on page 309 of our current volume, and remarked that parchment paper is as good a dyalizer as bladder or other animal membrane. All that is required is to make boxes with the sides of this parchment paper, fill them with brine, and set them into pure water. In a short time all of the crystallizable matter in the brine —the salt, niter, etc.—will pass through the paper, while the juices of the meat, all uncrystallizable matters, will be retained in the boxes, and may be used for making soup. The speaker exhibited specimens of parchment paper, such as is used by chemists, and observed that it is made in pretty large quantities.

## On the Alloys of Silver and Zinc. By M. Peligot.

In consequence of the increasing scarcity of silver money in France, which is constantly disappearing from circulation on account of the continued rise in the value of the metal, the French Government is about to lower the standard of the silver coinage by the addition of about 7 per cent more copper. The new money will be made of an alloy consisting of 835 parts silver and 165 parts copper. M. Peligot is chemist to the French Mint, and he has made experiments to ascertain how the introduction of zinc or the complete substitution of zinc for the copper would affect the alloy. He has found that alloys of the legal standard in which part or the whole of the copper was replaced by zinc are remarkably malleable, and when rolled are perfectly homogeneous. They are of a beautiful white color, but the binary alloy of silver and zinc is somewhat yellowish. The fusibility of the zinc alloys is greater than the copper; they are very sonorous and elastic, and if made brittle by hammering, the malleability is restored by heating. The study of the atomic alloys showed curious results. Equal equivalents of silver and zinc, or two equivalents of silver to one of zinc, gave malleable alloys, while the compounds $Ag+2Zn$ and $2Ag+3Zn$ are too brittle to be rolled. As a matter of economy, the author recommends that his Government should employ zinc to reduce the value of the present money, the price of zinc being only one-fifth that of copper. Another recommendation to the zinc alloys is the fact of its blackening less readily with sulphureted hydrogen than the copper compound, copper, indeed, seeming to increase the discoloration. An alloy of 800 of silver and 200 zinc will keep its whiteness in a solution of polysulphide which will rapidly blacken the legal alloy of copper and silver. This, as the author points out, will be useful information to the makers of jewelry. The absence of verdigris under the action of acid liquors is another advantage. In conclusion, the author mentions a fact of no great importance to us, namely, that the introduction of zinc into money is nothing new. French copper money contains one per cent of zinc, and the small coins of Switzerland contain zinc, silver, and nickel.

## The Way to make an Eolian Harp.

Of very thin cedar, pine or other soft wood, make a box five or six inches deep, seven or eight inches wide, and of a length just equal to the width of the window in which it is to be placed. Across the top, near each end, glue a strip of wood half an inch high and a quarter of an inch thick, for bridges. Into the ends of the box insert wooden pins like those of a violin to wind the strings around, two pins in each end. Make a sound-hole in the middle of the top, and string the box with small catgut, or blue first-fiddle strings. Fastening one end of each string to a metallic pin in one end of the box, and, carrying it over the bridges, wind it around the turning pin the opposite end of the box. The ends of the b should be increased in thickness where the wood pins enter by a piece of wood glued upon the insi Tune the strings in unison and place the box in t window. It is better to have four strings as scribed, but a harp with a single string produces exceedingly sweet melody of notes which vary w the force of the wind.

## Suspending Life.

A scientific German publication states that, amo other curiosities, Dr. Grusselbake, professor of chemistry at the University of Upsal, has a little serpent which, although rigid and frozen as marble, can, by the aid of a stimulating aspersion, discovered by the Doctor, be brought to life in a few minutes, becoming as lively as the day it was captured, now some ten years ago. Dr. Grusselbake has discovered the means of benumbing and reviving it at his pleasure. If this principle could only be carried out for man as well as for reptiles, death would lose its empire over mankind, and we should preserve life as the Egyptians preserved their mummies. Dr. Grusselbake's pr cess is nothing more, apparently, than simply lowering the temperature, just to that point where the cold produces a complete torpor without injuring any of the tissues. In this state the body is neither dead nor alive, it is torpid. The professor has laid his scheme before the Swedish Government, and proposes that a condemned criminal shall be handed over to him for the purpose of experiment! The savant purposes, if he can only get his man, to benumb him as he benumbs his little serpent, for one or two years, and then to resuscitate him from apparent death by his *aspersion stimulante*.

## Action of Light on Honey.

Honey fresh from the comb is a clear yellow sirup, without a trace of solid sugar in it, but upon straining it gradually assumes a crystalline appearance, and ultimately becomes a solid mass of sugar. It has not been suspected that this change was due to a photographic action, but this appears to be the case. M. Scheibler has inclosed honey in stoppered flasks, some of which he has kept in perfect darkness, whilst others have been exposed to the light. The invariable result has been that the sunned portion rapidly crystallizes, whilst that kept in the dark remains perfectly liquid. It is thus seen why bees are so careful to work in perfect darkness, and why they obscure the glass windows which are sometimes placed in their hives. The existence of their young depends on the liquidity of the saccharine food presented to them, and if light were allowed access to this, the sirup would gradually acquire a more or less solid consistency and would seal up the cells.

## Work for Boys.

In the present emergency of the country every hand ought to be well employed. The war has absorbed the working power of the country to an alarming degree, and as a consequence the amount of agricultural productions are much diminished. There are droves of boys in this city who ought to be profitably employed, and it would be a good service to them as well as to our farmers if they could be got out of the city to assist in farm labors. They can be used for all kinds of light labor, and especially in the approaching hay and harvest season. We would be glad to see some energetic movement started in our larger cities to send to the farmers such boys as are not otherwise profitably employed.

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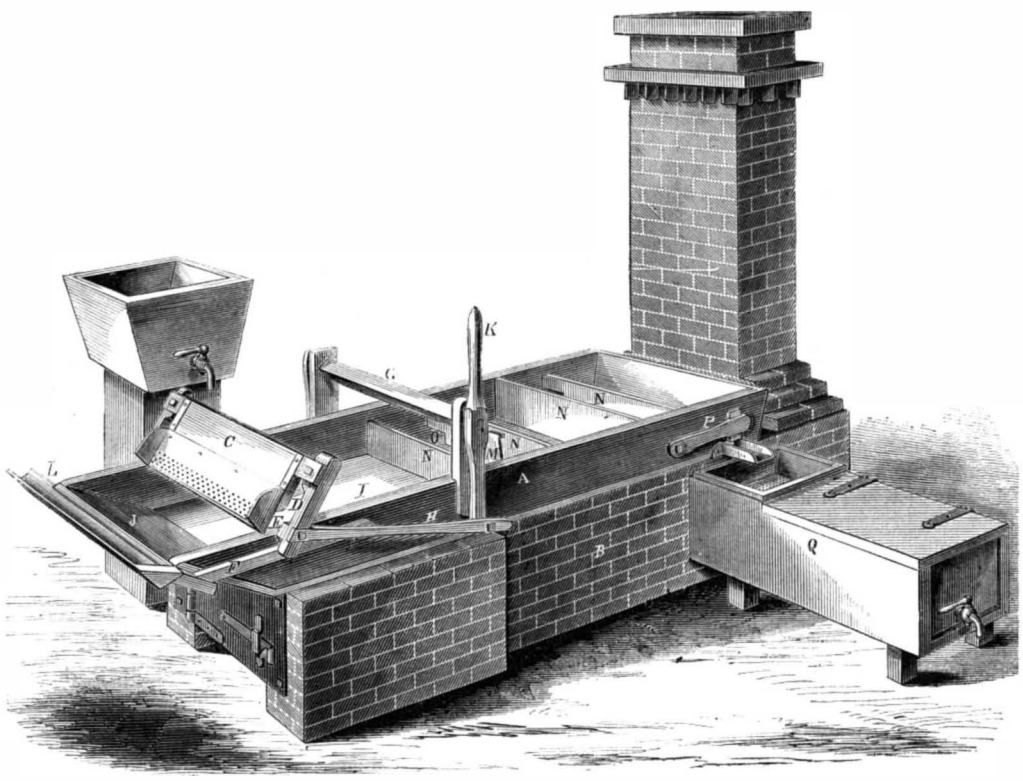
### Improved Evaporator.

The annexed engraving represent a new evaporator for manufacturing sorghum sugar. When the article just alluded to becomes a staple product at a low price, we shall certainly owe a great deal to the ingenuity and perseverance of inventors, for they are doing all in their power to provide the community with the requisite apparatus for its manufacture. Appended is a description by the inventor. A represents the sides of the pan, B the furnace, and C the skimmer, at each end of which are attached head-blocks, D. These head-blocks have inward projections, E, which form bearings on the rods, F; these act as slides to elevate the skimmer, C, in its backward movement. The rock-shaft, G, has levers, K, attached at each end, the lower ends of which are pivoted to the rods, H, and the front ends to the head-block, D.



PRICE'S SORGHUM EVAPORATOR.

The operation is as follows:—The cold juice is let into the front or defecating apartment, I, and when it commences to boil all the scum flows forward and is deposited on the inclined end, J. After a quantity of scum has gathered, the operator takes hold of the long lever, K, and draws the skimmer back until it drops off of the rods, F F. The skimmer is then moved forward to and upon the inclined end, J, depositing the scum as it goes in the gutter, L; after the skimmer is thus moved forward the rods drop back to the position shown. When the juice is sufficiently cleansed, the gate, M, at the first partition is raised and the juice allowed to flow into the back part of the pan (previously supplied with water), which is divided into sections by the partitions, N; these partitions have openings, at alternate ends, which cause the juice to flow in a transverse channel until it reaches the outlet at the gate, P. When the juice is concentrated to the proper degree for sirup or sugar, it is let out into the cooler, Q, which is furnished with a strainer to catch all the pomace and dirt which is not skimmed off when boiling. These evaporators have given general satisfaction wherever they have been introduced during the past year; and the invention is covered by two patents issued through the Scientific American Patent Agency to Thomas J. Price, Industry, Ill., they bear date respectively Jan. 28, 1862, March 15, 1864; all further information can be had by addressing T. J. & J. M. Price, manufacturers, Industry, McDonough county, Ill.

### The Hessian Fly and its Remedy.

Mr. Lewis Bollman, of Bloomington, Ind., gives this description of the Hessian fly in his article on wheat, in the Report of the Agricultural Department of the United States Government:—

"The received account of the introduction of this fly into the United States is known by every person, for its common name refers to it. That it was brought in some straw with the Hessian troops, employed in the Revolution against us, is possible; but the history of like pests shows that sooner or later they spread over the whole earth where their favorite food may be grown and climatic influence will permit. The bee-moth and the curculio are instances of the fact that nearly all the products of the farm have their enemies. It is not necessary to describe this fly, nor particularize the nature of its depredations, except to say that it deposits its eggs, from twenty to forty in number, in the hollow of the blades of the wheat. The egg hatches a small, light-colored worm, in from four days to three weeks, according as the weather is warm or cool.

"The worm crawls down the leaf between the sheathing of the leat and the stem, firmly fixes itself there, sucking the juices or sap of the plant on which it lives. It gradually becomes imbedded in the stem by the latter growing around it. As it increases in size, it becomes in color, size, and shape, like a flax seed; hence this state of the larva is called the flax-seed state. In this condition it remains during the winter, unaffected by the severest cold. In May it is changed into the fly, and this fly lays its eggs higher upon the same stalk, and on others around it, and also on the spring wheat. These eggs hatch, and the worms undergo the same changes until in August, when they appear as flies, ready to deposit eggs on the young fall wheat plants. The fact that of so many eggs but few hatch (for not more than two or three worms are found in the same plant) shows that the Hessian fly has its deadly enemies. This is true; two of which I will notice, being parasites of this parasite. Both these are flies, one of which deposits its eggs within the egg of the Hessian fly. Both these eggs hatch, but the worm from the last-deposited egg is within the worm of the Hessian fly, and it lives upon it, gradually destroying it, until, having undergone its various changes, it emerges from the skin of the Hessian worm a fly, ready to deposit its eggs in those of the Hessian fly. The other parasitic insect lays its eggs in the larva when in the flax-seed state, which hatches within it and lives upon it. It is to these friendly insects we owe the fact that the Hessian fly does not spread over large districts of the wheat region, nor, indeed, in any part of it to any great extent, and that it is seldom destructive in the same place for more than a season or two. The friendly flies, by their rapid increase, soon drive the Hessian fly to other portions of country in order to shun their fatal attacks. The usual remedy against the Hessian fly is late sowing of the winter wheat. Whilst this may afford some protection, it leads to habitual late sowing, by which the plant is weakened and rendered less able to endure the changes of our winters. A greater loss is thus occasioned than would result from an occasional entire destruction of the crop by the fly. A strong-rooted plant will more easily overcome a serious attack of the fly than a late sown and weak one can resist the freezing out, to which it is certain to be exposed."

A CITIZEN of Biddeford, Maine, who, a little more than a year ago, worked as a machinist in Laconia repair-shop for one dollar and a half per day, now pays a tax on a net income of $27,000—made in the manufacture of cotton machinery.

THE London *Times* says that the English Government has bought the Laird rams for £225,000.

### The Iron-clad Steamer "Tonawanda."

This formidable monitor, now in rapid course of completion at our navy-yard, was designed and built under the supervision of Henry Hoover, Esq., Naval Constructor, attached to this station. The hull of the *Tonawanda* is one solid mass of live oak. Her extreme length is 272 feet 9 inches; length between perpendiculars, 260 feet; beam molded, 40 feet; beam extreme over armor, 53 feet; depth of hold, 12 feet 2 inches; area of greatest traverse section, 568 square feet; depth of armor amidships, 5 feet 9 inches; weight of wooden hull per section, 1,386 tuns; launching draught, mean, 8 feet 9 inches; load draught, 12 feet 2 inches; displacement, when ready for sea, 3,300 tuns; projection of overhang, 12 inches. At the underside of the beam, at the load line, the clamp or backing is 3 feet thick, reduced to 7 inches at a distance of 5 feet 9 inches, falling in fair with the ceiling. Thickness of timber in hull, 9 inches; planking, 7 inches; lagging, 12 inches; armor, five-inch plates—thus offering a solid resistance of 38 inches of live oak and 5 inches of iron-plating, to which must be added the zones or armor-bearers, which pass longitudinally around and encircle the whole ship. They are of iron, 6 inches deep by 4 inches thick, and placed 4 inches apart, making the plating in reality 11 inches thick; the weight of the side armor and zones is 729,494 lbs. The deck beams are of oak, 12 by 14, and 36 inches from center to center. The deck consisist of, first, an oak planking 6½ inches thick, then two ¾-inch iron plates—on top of this comes a yellow pine planking three inches thick.

The *Tonawanda* has two turrets, the forward one carrying the pilot-house. They are 23 feet diameter inside, 9 feet high, and composed of eleven one-inch plates. Each turret, with machinery, weighs 316,340 lbs., pilot-house 45,400 lbs. Four 15-inch guns comprise her armament, each gun, with its carriage, weighing 66,000 lbs. The amount of fighting expected may be judged from the fact of her carrying 12,000 lbs. of powder, 50,000 lbs. of shell, 60,000 lbs. of solid shot. The magazine and shell-rooms are on either side of the turrets. Her engines, by Merrick & Sons, are horizontal, direct-acting, 30 inches diameter, 21 inches stroke. There are two screws of brass 10 feet diameter and 14 feet pitch. Steam is supplied by two of Martin's vertical tube boilers having a front of 38 feet 6 inches, 11 feet deep, 9½ feet high. There are 16 furnaces in all, each 6½ feet by 3 feet. Each screw is driven by its own independent engine. By this arrangement the ship can be steered by the propellers alone, in case the rudder should become damaged or be carried away. The anchor, when let go, takes the chain directly from the locker without overhauling. It can veer away chain with perfect safety, and is easily controlled while riding heavily. In one minute the chain is passed to the capstan, and all is then ready to heave away. In ordinary cases the chain is taken in at the rate of three fathoms per minute, when the anchor is chain-bitted. This is all performed without handling, the chain paying itself in and out of the locker.—*Philadelphia Bulletin.*

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## RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

*Pump.*—This invention consists, first, in a novel trip-valve arrangement for admitting of the escape of water from the eduction pipe of the pump after each operation of the same, whereby the pump is prevented from being rendered inoperative in winter by freezing, and fresh, cool water always obtained in summer. The invention consists, secondly, in a novel construction of the plunger of the pump, whereby the former is made to serve as an air-vessel as well as a plunger, and considerable expense saved in the construction of the pump, and the latter also materially simplified. It consists, thirdly, in the use of a cap attached to the pump box at the top of the well or cistern, and provided with a brake joint, whereby a very simple, economical and durable means is obtained for a pump fixture at the top of the well or cistern. John Munson, San Jose, Cal., is the inventor of this improvement.

*Furnace for Desulphating Ores*—This invention relates to certain improvements in that class of furnaces known as upright terrace furnaces, and the object of these improvements is to regulate the velocity with which the charge passes through the furnace and to reduce the time necessary for a perfect roasting or desulphuration of the ores by the peculiar shape and construction of the terraces and by their peculiar position in relation to each other; also to reduce the expenditure of fuel and to regulate the temperature throughout the furnace by the application of hot-air apparatus and cold-air pipes, in combination with the terraces, and to make such disposition in the internal arrangement that the furnace is applicable for the reduction of gold, silver, quicksilver and other ores. C. A. Stetefeldt, of New York city, is the inventor of this improvement.

*Portable Screw Press.*—This invention relates to a new portable screw press for pressing cheese, expressing juice from fruit, pressing lard and other substances. The object of the invention is to obtain a press of the kind specified which will admit of the screw, after the pressing operation has been performed, being turned down to a horizontal position so as to be entirely out of the way and allow the article which was compressed to be removed from the bed of the press with the greatest facility, there being no parts to interfere with the ready removal of the compressed article; the screw at the same time being capable of being adjusted and secured in an upright position so that it may perform its work, The invention further relates to an equalizer or regulator connected with the screw and constructed and applied in such a manner that the follower, while being forced down under the action of the screw, will be retained in a horizontal position and made to press the substance underneath it in an even manner so as to leave a horizontal upper surface on the same, however irregular said upper surface might have been previous to its subjection to the pressure. Charles D. Brand, of Oak Hill, N. Y., is the inventor of this improvement.

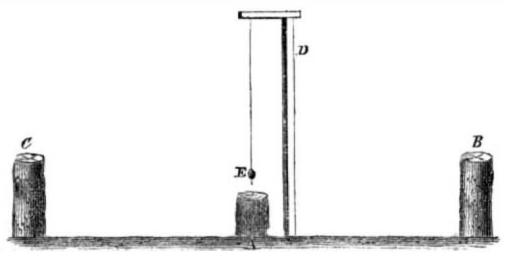
## THE GOVERNMENT EXPERIMENTS IN WORKING STEAM EXPANSIVELY.

On page 212 of our current volume, we published the circular of the Commission appointed by the Secretary of the Navy, "to devise and conduct a set of experiments, to ascertain, by means of practical results, the relative economy of using steam, with different measures of expansion." The Commission consists of Horatio Allen, Esq., President of the Novelty Works, in this city, and B. F. Isherwood, Chief of the Bureau of Steam Engineering, U. S. N. The apparatus is now nearly completed and in place on East 14th street, between Avenues C and D, in this city, and the Commission are just ready to commence their experiments. The experiments have been judiciously arranged, and there can be no doubt that they will be intelligently and carefully conducted. They will furnish more positive knowledge of the economic value of expanding steam, and of the proper amount of expansion, than all previous experience, and will consequently be of inestimable value. We purpose to give a full history of them during their progress, and we are glad that they will come just in time for our next volume.

## Correspondence

### How to draw a Line due East and West by the rising and setting Sun.

Messrs. Editors:—To draw a line due east and west by the rising and setting sun, the time must be between the 20th and 21st of June. It will be seen by the almanac that the declination of the sun is the same for both days; so there is no allowance to be made for that. At other times due allowance should be made. The track of the sun is like a screw cut on a globe, with a pitch of about 17 m les. The first thing is to drive the stakes, A and D—the latter is four or five feet high; on the top of this I nail a shelf on which to set a level. At the time the observations are made the inclinations should be the same morning and evening. About half an hour before sunset I drive the stake, C, about 15 feet from A. E is a plumb line, which will cast a shadow on C. I make a mark




on the shadow where it intersects the stake, and notice by the level the position of the sun. The next morning I drive the stake, B, the same distance from A (the center), and mark where the shadow crosses. I can see by the level the time to make the observation. I then take my trammel, set one point at A—the center; with the other point I mark on B and C. The points, B and C, are east and west without any variation. On account of the risk of fair weather it is best to get ready on the 19th, and drive the center stake and the stake, D, and set the shelf with the plumb line. In that way I should have two days, if the weather was fair, to make the observations in.

Jared W. Smith.

New Haven, Conn., June 9, 1864.

### To Find the Diameter of a Circle from which a Square or Hexagon can be made.

Messrs. Editors:—Workmen are often puzzled to find the diameter of a circular piece from which to make a square or hexagon of given size. The following rules are correct for the square:—Multiply the length of a side by 1·414213 and the product will be the diameter to which the material must be turned. For the hexagon multiply the distance across at right angles to the sides, by 1.1547 and the result will be the diameter. A slight allowance in excess should be made to insure sharp corners. S.

Rochester, N. Y., June 6, 1864.

### Iron for Peach Trees.

Messrs. Editors:—Having noticed several articles relating to agriculture in your paper, and knowing that all ideas however small may result in benefiting somebody, I wish to relate something that has come under my own observation. For the past seven years, while working in a machine-shop, the iron shavings (both wrought and cast-iron) have collected around the buildings to the depth of several inches, and under these several peach trees have sprung up and are now bearing fruit every year. The leaves hold their color throughout the season, a very dark green; while for miles around not a tree can be brought to bear before it is affected by the disease so prevalent in this part of the country. If any one will take the trouble to try this experiment of putting iron-dust or clearings taken from a machine-shop around their trees, I think they will meet with success. A Subscriber.

Waltham, Mass., June 11, 1864.

## NEW BOOKS AND PUBLICATIONS.

The Camera and the Pencil.—Mr. M. A. Root, who for many years enjoyed a world-wide reputation as a heliographic artist, has of late devoted himself to the duty of placing before the public some of the results of his large professional experiences. In a genially written, interesting work, under the above title, of which we have received an elegant first volume, the whole history and practice of the heliographic art, is clearly set forth. The author's own resumé will convey a true idea of the intrinsic value of the work.

"Each volume is complete in itself, though the two are related to each other. The first volume is chiefly *theoretic*, containing chapters on the 'Fine Arts,' 'The Uses of Heliography,' 'Qualifications of a First class Heliographer,' 'The Sunbeam,' 'The Harmony of Colors,' 'The fitting-up of Heliographic Rooms.' Several chapters on 'Sitting for a Portrait,' with minutest directions about position, the management of light and shade, etc., etc. Four chapters on 'Expression,' that essential to a genuine portrait, illustrated by portraits engraved on steel. Several chapters comprising 'Thoughts' of the most eminent artists and art-critics, ancient and modern, with original comments, covering the *æsthetics* of Photography; 'The Microscope,' with its revealed wonders, etc., etc., together with a full and minute chapter on the 'Coloring of Photographs' in India-ink, water and oil colors, in all of the styles now popular both in America and Europe. All these specialties make this volume not only a valuable vademecum for artists of every class, but also worthy of a place in every house, on every center-table, and especially in every photographic reception-room, for visitants to examine while awaiting their sittings, and thereby to learn what constitutes a good portrait, and how to obtain one." Appleton, New York, Publisher.

### Wiard's Gun.

Appended is a description of Wiard's gun which burst recently at Trenton, N. J.:—"The gun is diminished in thickness, but is surrounded with an outer case or "jacket" connected to the gun proper by arms—the whole, however, being one casting. A cross-section resembles an open car-wheel with covered arms. By this method a greater surface for radiation is gained, thus cooling the gun more quickly, and the expansive force is transmitted by the arms to the jacket, which is cool, and strong enough to be secure from bursting. In this way the unequal expansion of the inner and outer surface of the gun is avoided. The dimensions of the gun are:—Diameter of bore, 15 inches; length, 10 feet 6 inches; outside length, muzzle to cascabel, 13 feet; greatest diameter of jacket, 5 feet; diameter through trunnions, about 6 feet; weight of rough casting, including head, 52,000 pounds; weight of finished gun, 44,000 lbs."

This gun was fired with 80 lbs. of fine powder and a shot of 900 lbs. weight. The elevation was said to be 30°. When the charge was exploded the gun burst.

### Now is the Time.

A subscriber, renewing his subscription for another year, says:—"There is no expenditure to which I am subject which I bear more willingly than the payment of my subscription; and it is a standing wonder to me how any mechanic, who wishes ever to be other than a 'hewer of wood and drawer of water,' can neglect the opportunity to purchase so much that he needs for so insignificant a sum—a single day's labor *versus* fifty-two numbers of your paper." This is the opinion of thousands of our mechanics and manufacturers, and we trust that thousands more, with the beginning of the new volume, will be added to our subscription list. Three thousand subscriptions expire with this number, and we hope each one will promptly renew his own, and, if possible, get a neighbor to join with him in taking the Scientific American for six or twelve months.

A subscriber says:—"Praise may be superfluous, but I wish to testify to the typographic neatness of your journal. Its elegance will not fail to attract general attention, and thus lead to a better acquaintance. If permitted to offer a sentiment, I would propose, "The Scientific American—it is wholly American, and should be patronized by every American in America!"

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### Linen Import and Manufacture.

Our civil war, along with other results, has tended to stop the supply of cotton, to prove the inadequacy of other countries for a sufficient yield of the right staple, and, consequently, to substitute other fabrics. The effect is marked very clearly in English trade returns. Linen has been produced in an unparalleled quantity there, and exported to us more largely than ever before. In the first three months of 1862 the total value of linen piece goods exported from England was £982,013; in 1863 it was £1,327,895, and in the corresponding period of 1864, £1,869,785. This production and export includes white and plain piece-goods; checked, printed, and dyed ditto; cambrics and lawns; damasks and diapers; sail cloth, thread, and hosiery. The total value of exports of linen manufactures of all kinds in the first quarter of 1864 amounted to £1,998,452, against £1,454,777 in the corresponding quarter of 1863, and £1,088,363 in the corresponding period of 1862. The export nearly doubled in three years. This country, too, was the largest consumer and customer for this wonderful increase, which amounts to no less a sum than £,910,-089 or $4,550,445 for a single quarter, and $18,201,-780 per annum. We import to the value of £378,735 in 1862, £556,774 in 1863, and £914,917 in 1864. This is an increase in linen goods of £536,182, or about $2,681,000, in one quarter, produced in two years. The increase in a year, at this ratio, would be $10,723,640. The last returns show that the increase is still increasing; and that, although some suffering has been produced among British operatives by the cotton famine, and some mills rendered less valuable, the suffering is compensated in another quarter by an excessive and unparalleled consumption of linen.

These facts show that linen manufactures here are starting at the right time. The creation of so good and sudden a demand cannot but carry up prices, The duties will be added to that cost and render linen manufactures very valuable. We have some manufactures of this kind and evidently need more. Their erection will lead to the immigration of skilled operatives, and thus we shall be permanent gainers through a lesson and discipline of loss. It will also stimulate the production of flax and hemp, and thus we shall have another crop added to the vast variety that already vary our agriculture. Kentucky and Missouri cannot supply even their former yield now. Other States may therefore prepare to meet a profitable demand, and do it safely, since it has been shown that flax-growing does not injure the soil, as it was supposed to do.—*United States Gazette.*

### Horses and Mules.

During the year ending June 30, 1863, there were purchased 173,832 horses and 86,254 mules, and there were captured 7,783 horses and 6,915 mules, which, added to those on hand at the commencement of the year, made the number 197,457 horses and 110,068 mules. There were condemned, sold, died or lost by capture, during the year, 57,676 horses and 17,170 miles. More than one horse out of every four was thus *hors du combat*, while nearly one mule in every seven was a used-up beast. Yet, $16,631 58 was paid for veterinary surgeons, and $39,292 39 for medicines for horses and mules. This unprecedented destruction of horses and mules will have somehow to be arrested, or it will become impossible to remount our cavalry or to provide animals for the artillery and wagon trains.

### Royal Patent to wear a Nightcap.

Agnes Strickland, in her "Lives of the Queens of England," in giving an account of the rewards bestowed by Queen Mary upon her friends after her accession, says:

"The Queen's gratitude took a very odd form in the case of the Earl of Sussex; he was a valetudinarian, who had a great fear of uncovering his head; and, considering that the colds he dreaded respected no person, he petitioned Queen Mary for leave to wear his nightcap in her royal presence. The Queen, in her abundant grace, not only gave him leave to wear one, but two nightcaps, if he pleased. His patent for this privilege is, perhaps, unique in royal annals:—

Know ye, that we do give to our well-beloved and trusty cousin and councillor, Henry, Earl of Sussex, Viscount Fitzwater, and Lord of Egremond and Burnell, license and pardon to wear his cap, coif or *nightcap*, or any two of them, at his pleasure, as well in our presence as in the presence of any other person or persons within this our realm, or any other place in our dominions wheresoever, during his life; and these our letters shall be his sufficient warrant in his behalf.

"The Queen's seal, with the Garter about it, is affixed to this singular grant."

## MISCELLANEOUS SUMMARY.

An Enormous Scale.—An enormous scale, the largest perhaps in the country, has just been finished at Cleveland for the Fort Pitt Works in this city. They are intended to weigh the monster twenty-inch gun, and are of the following dimensions: Length, 30 feet breadth, 7½ feet, and 4 feet in hight. They will weigh from two pounds and a half up to one hundred tuns, and are so nicely and accurately adjusted that the weight of half a pound will turn the beam. A half a pound weight on the beam weighs one tun on the scales. They are built entirely of wrought iron, with the exception of the lever heads, which are cast. The pivots are made of wrought-iron steel edges, for the purpose of securing greater strength and durability. The cost of these scales, when set up in Pittsburgh, will be $2,000.—*Pittsburgh Chronicle.*

Lyon, Sharp & Co., of the Sligo Iron Works, contributed to the St. Louis (Mo.) Sanitary Fair a great variety of superb iron, among which are some rare specimens—one sheet, a boiler head, one hundred and two inches in diameter, half-inch thick, weighing one thousand one hundred and sixty pounds, the largest sheet ever made in the United States, and also several pieces of sheet-iron, rolled to the one nine-hundreth of an inch in thickness, with Russia iron polish on both sides—probably the thinnest sheets ever made—as considerable ado was made through Europe over some sheets rolled in Germany nearly one-half thicker than this. This has a Russia iron surface on both sides, and is as tough as bank-note paper.

Boiled Telegraph Wire.—Boiled wire is used by some telegraph companies, and the process of preparing it is thus described:—"The wire, in coils, is placed in a large iron cauldron, filled with linseed oil, and boiled about fifteen minutes, when it is presumed to be 'done.' By this process it receives a coat of glazing, which preserves it from rust. The wooden blocks, or braces, by which the insulators are placed, are also boiled, but in different material. They are made of sycamore wood, and are boiled—100 at a time—for a period of one hour, in ordinary coal tar. The effect of subjecting the scyamore to this process is to render it secure against warping or cracking from sun or rain."

A monster steam feed mill designed for the United States Government for recruiting army horses in the public stables, near Washington, is now being constructed at the machine works of Messrs. C. & J. Cooper, Mount Vernon, Ohio. The engine is 100-horse power, and the mill capable of grinding 225,-000 lbs. of grain or hay in ten hours. This feed is to be mixed and cooked by steam passing through six-inch horizontal iron cylinders, carried by an apparatus like a chain-pump; to be wetted, steamed and then dried as it is carried along.

Another Iron-Clad.—The iron-clad *Tunxis*, of the third class, was to have been launched at Chester, Pa., on the 4th inst. She is put down in the register at 614 tuns, and has one revolving turret, mounting two heavy guns. A great many improvements are said to have been made in her construction from the original vessel. She will be fitted for sea immediately. The whole iron fleet is in a prosperous state of forwardness, including the great *Puritan*, *Dictator*, and *Dunderberg*.

Enterprise in California.—The Washoe *Weekly Star* states that in Humboldt District, a company is constructing a canal sixty-three miles in length, five feet deep and sixteen feet wide, to lead the waters of Humboldt river to the mining sections of the different districts. This canal will give water power for any number of quartz mills. A city has been located by a company on both sides of the canal, in the richest section of the country where mills are to be built, and it is claimed that this will be the center of business in Humboldt county.

Improvements in Iron-making.—It is well known that iron undergoes three processes before it is fit for the forge—smelting, refining, and puddling. The smelting-furnace only yields pig-iron, which is a combination of iron with as much carbon as it can take without becoming plumbago, and the subsequent operations tend to deprive it of its superabundant carbon in order to render it malleable. A new process has now been invented, by which malleable iron may be obtained direct from the smelting-furnace; it consists in driving oxide of iron into the furnace by means of the ventilator, whereby all the carbon is at once absorbed. In order to apply this method, the hearth of the smelting-furnace must be built somewhat higher than usual, and the air driven in by the ventilator is previously made to pass through three chambers, in which it becomes charged with oxide of iron at a high temperature, the atmospheric pressure being at the same time kept very high.

The dangers arising from the universal adoption of the common lucifer-match have induced chemists to seek a substitute for it. M. Peitzer has recently proposed a compound which is obtained in the shape of a violet powder, by mixing together equal volumes of solutions of sulphate of copper, one of which is supersaturated with ammonia, and the other with hyposulphite of soda. A mixture of chlorate of potash and the above powder will catch fire by percussion or rubbing; it burns like gunpowder, leaving a black residue. M. Viederhold proposes a mixture of hyposulphite of lead or baryta, or chlorate of potash, for matches without phosphorus. The only inconvenience of this compound is that it attracts moisture too easily.

Solid Drawn Steel Tubes.—The London *Engineer* says:—"An influential company has been formed to purchase and work the patents of Messrs. Hawksworth & Harding for drawing steel tubes, hollow steel wire, or ordnance cylinders from solid steel, by hydraulic pressure. The machinery by which this is effected has been worked experimentally in Paris for the last two years, and it is stated that the French Government are negotiating for the supply of ordnance barrels thus drawn by hydraulic pressure. The machinery is now working (with a 600 tun press) in Willow Walk, Bermondsey."

Eggs in Photography.—We are informed by Professor Seely, editor of the *American Journal of Photography*, that more than 1,200 dozen of eggs per week are used in New York and vicinity for albumenizing paper for photographs. A great deal more than this quantity of albumen is thrown away every week in the blood of the animals slaughtered for this market. Could some plan be devised for separating the albumen from the blood it would be a very valuable discovery.

A Pair of Rebel Shoes.—A resident of Wheeling, who has been to Cloyd's Mountain, the scene of the late fight between Crook and Jenkins, secured a pair of rebel shoes. The soles and heels are of wood, and appear to have been sawed out by machinery. The uppers, which are of very heavy, stiff and badly-tanned leather, are nailed upon the wooden soles with large tacks and welts. The shoes are exceedingly clumsy and heavy.

The Scientific American.—We have been an attentive reader of this paper for years, and always have felt after its perusal that we have been doubly paid for the time spent in its reading. For our part, we cannot see how a mechanic who cares to perfect himself in his business and also to know what is going on in the mechanical world around him, can do without it. Its cuts and illustrations are rarely equalled—never excelled, and in fine it is a *live* paper for a *live* mechanic.—*Shoe and Leather Reporter, New York.*

A California Herdsman.—A late California paper says that Abel Sterns of Los Angelos, California, lost about 7,000 head of cattle, through want of food, during the last winter. That gentleman is believed to be the largest stock and land owner in the United States. He owns this year 48,000 cattle besides 9,000 calves.

The Franklin File Co., of Bridgeport, Conn., which manufactures files by a machine of American invention, furnishes the market with an article superior to those made by the French patent.

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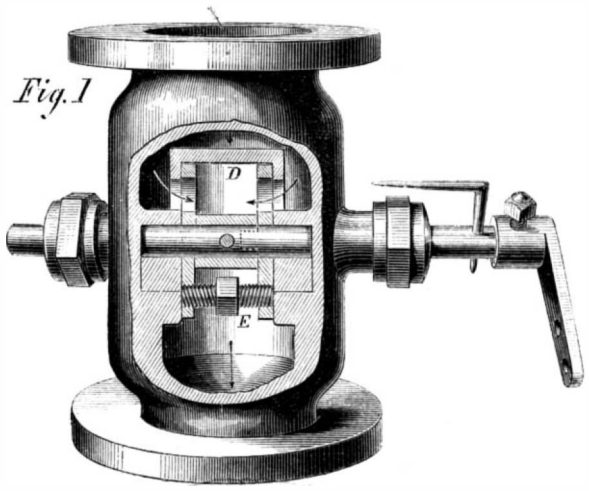
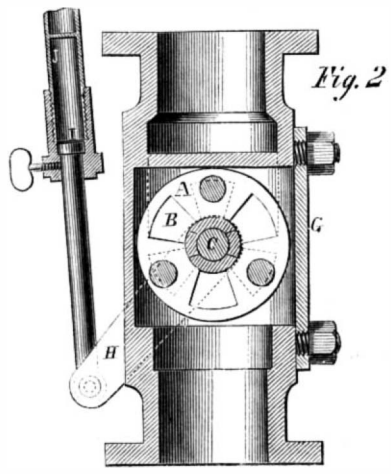
### Improved Governor Valve.

A simple, efficient and economical governor valve is always in demand; no matter on what principle it is constructed, it is sure to find purchasers providing it does its work well and economically. The engraving published herewith illustrates an improved governor valve, which is said by the inventor to be a very superior one. The invention consists in fitting a disk, A, having a number of radial openings, B, on a shaft, C, in such a manner that the two faces of the valve shall be steam-tight and yet free from steam pressure except when open. This is accomplished by placing the valves in a chest, D, and furnishing set-screws, E, to the valves, so that they may be set out to their seats, as they wear. The shaft, C, the valves are on, runs through the stuffing boxes, and is divided in the middle by a sleeve joint, so that the valves may be shifted as occasion requires. One of the valves has a boss on it through which a pin passes into the shaft while the other is simply a brass plate.

In Fig. 2 a side view of the valves and openings is given, and there is a bonnet, G, on the front which may be taken off when the valves want setting out or require inspection from any cause; this obviates the necessity of breaking the joint on the steam pipe. In Fig. 2 a joint is shown connected to the arm, H; this joint has a boss on the end which strikes against the stop in the sleeve, J. When the engine is to be started this joint is slipped up until it meets the stop, and the speed increases until the governor balls rise to their proper position; the thumb-screw at the bottom is then slacked off until the boss, I, falls to the position shown in the engraving. The set-screw shown is then tightened and the regulation of the speed is effected in the usual manner by the rise and fall of the arms of the governor. The valve is now in use in several mills, workshops, etc.; in this State and at the West; it is highly spoken of. Patented through the Scientific American Patent Agency by Alexander White, of Geneseo, Illinois, on the 15th of September, 1863. For further information address A. White & Co., as above.



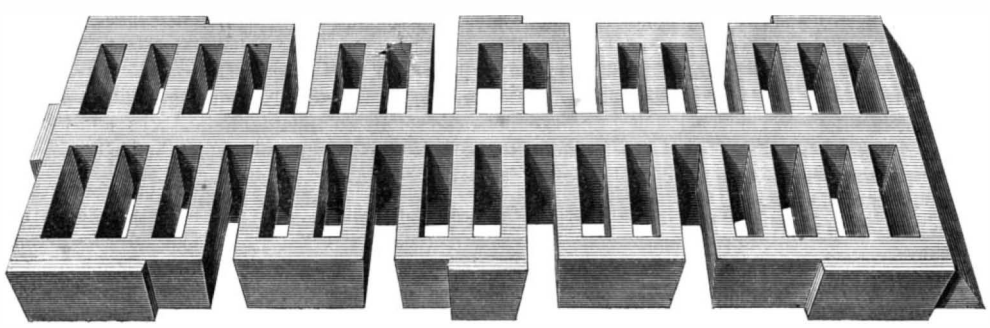

WHITE'S GOVERNOR VALVE.

### Improved Grate Bar.

Improvements in anything connected with burning fuel are of great importance and benefit to the manufacturing community. Boilers are daily undergoing changes in their plans and construction, and while the attention of some is directed exclusively to them, others feel that the furnace and its details is capable of great improvement. In the engraving published herewith a new grate bar is illustrated which is claimed to be a superior one. Some of the advantages it has over those generally used are thus set forth by the proprietor:—

"The peculiar form of construction—distributing the metal in such a manner that all strain caused by expansion from heat is obviated, consequently they will neither warp nor break. This bar has more air surface, uniformly distributed, so that it is kept perfectly cool, at the same time admitting a sufficient quantity of oxygen to give the fire a clear combustion, thereby saving from 15 to 20 per cent of fuel. It is economical as regards weight of metal; it also combines greater strength and durability, with less weight of iron than others in use—being at least one-third lighter. One of the greatest features of this bar is, that the fires are kept perfectly clean and bright with less labor than others, particularly in burning soft coal, by simply slicing on the top or pricking underneath. The bar is manufactured to suit the convenience of parties purchasing, making the openings to suit all kinds of fuel used. They are now successfully in use in more than five hundred places, among these are the largest steamships, steamboats and manufactories in the United States. In the saving of fuel and durability the testimony of the superintendents and engineers using them is given in a large numbers of letters, which we cannot publish in this place.

This grate bar was patented by D. Lasher on the 11th of September, 1860. Orders will be punctually attended to by addressing L. B. Tupper, No. 120 West street, between Cortlandt and Dey streets, New York; and at John Powers's machine-shop, 434 East 10th street, New York.



LASHER'S GRATE BAR.

### New Method of reducing Poor Lead Ores.

We translate the following by M. H. C. Lampadius, Engineer of the mines at Vüseck, from *Le Moniteur Illustrè des Inventions*:—

"The ores, according to their richness and the specific gravity of the acid, are treated with the proper quantity of hydrochloric acid to form chloride of lead. The transformation into chloride of lead operates completely when the minerals have been well prepared. This chloride is introduced into double-bottomed vats, and sprinkled with a sufficient quantity of boiling water.

"The solution of chloride of lead thus obtained is drawn off into reservoirs and left to settle. The mother waters, which contain only a very minute quantity of chloride, are reserved for a new solution. The chloride is then treated with a minute quantity of pure water by metallic zinc.

"There is thus formed chloride of zinc, and metallic lead is separated in a dense and spongy mass, which after being washed may be melted in an ordinary furnace.

"The solution of the chloride of zinc is first freed from any iron that it may contain by a little chloride of lime, and the zinc is then precipitated in the form of oxide of zinc by means of calcined chalk. It may thus be utilized as zinc white, or it may be reduced and used again.

"As hydrochloric acid is of a moderate price, and as the expense of the zinc is covered by the sale of zinc white, this process ought to be advantageous in the treatment of ores too poor to be treated by fusion."

### CAR SPRINGS.

The sensation of jogging along on a camel's back was compared, we think by Albert Smith, to riding in a wagon without springs, whilst sitting on a music stool screwed up to the top, and going across the furrows of a newly-plowed field. This sensation may be pleasing to those who are used to it, but civilized sensibilities require more delicate treatment, and we therefore use springs of a great number of strengths, shapes and sizes to obviate the effect of concussion, and prevent the inequalities of roads jolting our senses and nerves to pieces. Another reason, as potent, in favor of the use of springs, is the economy effected by them in preventing the jarring on bad roads, shaking the car, carriage or vehicle to pieces so soon as otherwise would be; a those springs best ada ed to answer these p poses will of course h preference over all o ers. In all places wh they can be applied, elliptic, and semi-ell tic springs appear to swer every purpose; but their expense and the space they occupy have caused several descriptions of springs to be made that unite cheapness with durability, ease of application, and taking up little room. The most useful and effective we have seen for passenger cars is the solid india-rubber circular spring, which has an ease of motion particularly suitable for that purpose. Where, however, very heavy dead weights have to be carried, as in freight cars, they are liable to burst, and in fact will not last long. By cutting the rubber however, into two or more pieces, and introducing metal between them, the rubber is made more durable but its elasticity is proportionately decreased. Another spring very extensively used and giving great satisfaction throughout the country for freight cars, made by the Metallic Car Spring Company of New York, is made of steel $1\frac{1}{2}$ inches wide and $\frac{3}{4}$-inch thick, fluted, and turned into a spiral $5\frac{1}{2}$ inches diameter, and of any necessary hight, which of course regulates the motion required. Between the coils of steel, in the groove, is placed a band of round india-rubber. The steel forms the spring, and the rubber simply acts as a cushion, but to a certain extent assists the steel and insures the durability of the whole spring, and is therefore peculiarly adapted for carrying heavy weights, and for freight cars, as it will not burst out like india-rubber, and cannot be broken, whilst it is quite as compact as the gum spring. Some master mechanics still stick to the elliptic springs for buffers, but we see on many of our best roads that the volute springs are taking preference over all others as being economical in first cost, easy of application and at the same time durable.

Department of Agriculture.—Varnum D. Collins, Esq., appointed agent of the Department of Agriculture by Commissioner Newton, has left the city to proceed to China, charged with the selection of new varieties of sorghum seed, and other agricultural products capable of acclimatization, and the collection of general agricultural information.

The Peruvian Government is at war with Spain, and a correspondent of the New York *Herald*, of the 15th inst., writing from Callao, says that shot, shell, torpedoes, infernal machines, etc., are in great demand. Our readers who are interested should take the hint and act upon it without delay.

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NEW YORK, SATURDAY, JUNE 25, 1864.

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## OUR NEXT VOLUME.

We have a richer supply of matter for the opening of our next volume than we have ever had in hand at any one time since we commenced the publication of the SCIENTIFIC AMERICAN.

For more than a year, the Commission appointed by the Secretary of the Navy to devise and conduct a set of experiments to determine the practical value of working steam expansively, have been engaged in the preparation of apparatus for this purpose; the machinery is now complete, and the series of experiments will be commenced just in time for us to give a complete history of them in our next volume.

The series of experiments by Messrs. Hecker & Waterman, to ascertain the value of working steam both expansively and non-expansively, in a cylinder with and without a jacket of steam, will also be fully recorded in the volume of the SCIENTIFIC AMERICAN that commences next week. As the Government experiments try the effects of a cubic foot of steam used in cylinders of different sizes, while in those of Hecker & Waterman the steam is worked with different measures of expansion in the same cylinder, one set of experiments will be the complement of the other. The two together ought to settle the disputed question of expansion, and thus to furnish the most valuable contribution to the knowledge of the action of steam that has ever been made.

We have also in our drawer a full statement by Fairbairn of his experiments to determine the proper thickness of steam boilers, with his carefully-prepared tables of the thickness required for shells, tubes and other parts in boilers of various sizes. To all manufacturers of steam boilers these tables will be worth more than the cost of the SCIENTIFIC AMERICAN for a hundred years.

Our sixteen pages will enable us to publish full accounts of these valuable experiments in addition to our usual variety, which embraces all matters of interest to be found in English and French publications devoted to science and the mechanic arts, as well as a minute history of the improvements which are constantly being made in all departments of our own varied industry. Our arrangements are better than ever before for the prompt publication of all contributions to scientific and mechanical knowledge which are being made in this country.

In spite of the gigantic war which is being waged in the land, the intense industry, the provident spirit, and the eager thirst of knowledge which characterize the graduates of our common schools, sustain an ever-increasing demand for our paper, and enable us to appropriate constantly-augmenting resources to the useful labor to which we have devoted our lives, the dissemination of the ever-accumulating knowledge of the world abroad among the multitudes of our people.

## SIMMERING.

To the dog, stretched upon the kitchen hearth, the hissing murmur of the water over the fire before it begins to boil is an unmeaning sound, or at best it is vaguely associated with the sensation of warmth; to the more intelligent cook the same sound is a warning that the water is about to boil; while to the still more intelligent student of science it is a manifestation of the most complex relations of the properties of matter and forces of nature.

Probably no substance has been the subject of more varied and laborious investigations than water, and among the properties which it is found to possess is that of absorbing gases.

It absorbs a little more than its own volume of carbonic acid gas, whatever the pressure, and as the gas is condensed by pressure, the amount absorbed increases in direct ratio with the pressure. At the ordinary atmospheric pressure, 100 cubic centimetres of water absorbs 106 cubic centimetres of the gas, which weighs 196 grammes. Now if the pressure is doubled, the same volume of gas will weigh 393 grammes, and all of this will still be absorbed by the 100 cubic centimetres of water. This property is made available in the manufacture of soda water. Carbonic acid is forced into the water under pressure, and when the pressure is removed by drawing the water into the open air, the gas gradually escapes, producing effervescence.

Water also absorbs the two gases which, mechanically mingled, form atmospheric air, but it absorbs the oxygen in larger proportion than the nitrogen. It is this oxygen absorbed by water which supports the life of fishes. Fishes perish instantly when placed in water from which the air has been expelled. This statement applies only to true fishes which breathe by means of gills; whales and porpoises are supplied with lungs, and breathe atmospheric air, rising to the surface at every breath; consequently they could live in water deprived of air.

When gases are absorbed by water their volume is enormously reduced; they are changed in fact from the gaseous to the liquid form. This change of form converts a large portion of their latent heat into sensible heat, raising their temperature. Ice absorbs sulphurous and chlorine gases so rapidly that the heat set free melts the ice.

The less absorbable gases, however, such as oxygen and carbonic acid, are almost wholly expelled from water by the freezing of the liquid. Carradori found that after water had been repeatedly frozen, a fish immersed in it died instantly.

The application of heat to water also expels the gases absorbed by it, the larger portion of the gas being expelled before the water begins to boil. It is this expulsion of gases by heat that produces the gentle commotion and hissing which is called simmering.

## THE PITCHES OF SCREW THREADS.

Reason and expedience both demand the early introduction of some fixed system for the pitches of machine screws. At present there is no standard whatever, and the inconvenience, delay, and expense resulting is felt every day. Repeatedly engines are stopped, presses stand idle, and pumps deliver no water, for the reason that some bolt has broken and another has to be made before operations can be resumed. But these delays, although vexatious and costly, are trifles compared to the want of mechanical system shown in this subject by the trade in general, it is a standing reproach to our machine-makers. None know the truth of this assertion better than they, and it is because no one moves earnestly in the matter that so little interest is manifested about it.

If all the foot-rules varied, or the standard of inches and fractions of it were at the mercy of any person, what confusion there would be, and yet a derangement similar in character exists at this moment in the subject of pitches for screw threads. It is safe to say that scarcely two shops use the same standard. One superintendent thinks twelve threads too coarse for half-inch bolts, another thinks it too fine; so between them they split the difference and make one of eleven and a half, or eleven and three-quarters to the inch; or what is still worse, an almost infinitessimal fraction less than any regular number, as for instance thirty-three or thirty-four threads in three inches. It is almost impossible to measure such threads on a single inch, and no true mechanic would ever make one for standard use. Such threads are made, however, and used daily; we have had positive demonstration of this fact.

The Whitworth standard is very generally used in England; so much so that it may be called the standard there, but with us there is no fixed idea, although there is great need for one. If the bolts of commerce, or those sold in hardware and ship-chandlery stores, were all of one pitch, for the relative diameters, it would be a convenience that many machine-shops would avail themselves of, and extensive works, even, could purchase sets of bolts, certified of the best iron, at less prices than they could manufacture them for in their own works. The advantages to be derived from some standard pitch seem to be worth working for.

## GRUMBLERS.

Reforms are not instituted by growling and fault-finding. There is an old fable of Esop's which shows how a wagoner who was bemired extricated himself. The hopeful genius in question, immediately upon his accident, sat down by the roadside and bitterly bewailing his predicament, called on Hercules to help him; instead of doing so Hercules gave advice and told the man to put his own shoulder to the wheel and help himself; in effect to stop grumbling and go to work. The wagoner did this, was successful, and went on his way rejoicing. There are a great many people in the world like the wagoner in this fable. They are always in hot water, forever in trouble. They throw the blame of their own misdeeds and want of judgment upon others, and if one might believe them, society would be found in a shocking state. They rail at everything, lofty or lowly, and when they have no grumbling to do, they begin to deprecate. They endeavor to make good actions seem contemptible in other men's eyes, and try to belittle every noble and praiseworthy enterprise by casting suspicion upon the motives of those connected with it.

Such individuals, whether men or women, are an incubus on any society, and the best way to paralyze their efforts to create discord, is to ignore them altogether. Let grumblers form a select circle by themselves. Let them herd together; give them the cold shoulder when they appear and make them uncomfortable during their sojourn, and if they cannot be cured they may be more easily endured, and perhaps discover the error of their ways and reform.

## ENGLISH ESTIMATION OF OUR MONITOR SYSTEM.

Some time since we chronicled the fact that two officers of high rank in the British navy had arrived in this country for the purpose of inspecting our iron-clads; the monitors we suppose, for we have but one other sea-going plated ship besides them, and that one is the *Ironsides*. These gentlemen have had every facility offered them to examine our vessels, and they are said to have recommended to the English Admiralty the adoption of the three principal features of importance in the monitors. These are Ericsson's turret, the compressors used in working our eleven and fifteen inch guns, the new ventilating system, and several other details of lesser importance. English prejudice against everything essentially American is so strong, however, that if the report is true, we have no idea that it will meet with favor, and the true-born Briton would much rather be sunk in his own craft than saved in ours.

### The Hecker & Waterman Experiments.

We have received notes of the first observations taken in this elaborate series of experiments, giving a clear idea of the mode in which they are conducted, but we postpone the publication till our next issue, in order that the history of the experiments may be complete in the coming volume.

HORSES PULLING AT THE HALTER.—Many remedies have been proposed for curing this bad habit, but a simple and effective one is, to discard the common halter, and get a broad strong leather strap to buckle around the neck for a few inches below the ears. A horse may pull at this, but will soon give it up.

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ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING JUNE 14, 1864.

*Reported Officially for the Scientific American.*

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

43,080.—Solution for gilding China, Glass, and other Wares.—Louis P. Angenard, New York City:

I claim the chemical proportion and preparation of the solution and its application to china, Dutch ware, glass ware and other potteries, as described, on the above.

43,081.—Awning.—Wm. Armstrong, Milwaukie, Wis.:

I claim the awning constructed of a series of folding slats combined and operating together with a supporting frame, in the manner substantially as herein shown and described.

[The construction of this awning is quite novel. Instead of canvas, which is liable to rot, mildew and become torn, the inventor constructs the awning of light wooden slats, which fold one over the other, like the leaves of a fan. Thin metallic slats might be employed. The slats are arranged on a suitable frame, and there are two pulling cords, one of which spreads the awning, and the other pulls or folds it up. Nothing can exceed the convenience of this improvement, while it is cheap and simple of construction.]

43,082.—Shaping the heels of Boots and Shoes.—Eben J. Beane, Providence, R. I.:

I claim the combination of a cutter, substantially as described, with a ridged or gaging roller, d′ and a yielding center stud, g, substantially as described for the purpose specified.

43,083.—Photographic Card Press.—J. B. Blair, Philadelphia, Pa. Ante-dated May 24, 1864:

I claim, first, The employment in a photographic card press of a small polishing roller, C, between two larger sustaining rollers, D and E, the three being arranged so as to operate together substantially in the manner described, for the purpose specified.

Second, I claim the application, to a photographic card press, of the adjustable deflector, F, the same being constructed and applied so as to operate upon cards, substantially in the manner set forth and described, for the purpose specified.

Third, I claim sustaining the pillow-blocks of the rollers, of a photographic card press, by means of an angular supporter, G, constructed and applied so as to rest with its angular bottom edge, g3, only upon an adjustable base of any suitable kind, which will permit it to vibrate thereon so as to adapt itself to the rollers, as described and set forth, for the purpose specified.

Fourth, I also claim the employment of a hand-wheel, H, applied to the card-supporting roller, as described in figure 1, for the purpose specified.

43,084.—Skiff or Boat.—W. E. Bond, Cleveland, Ohio:

I claim the described flat bottom skiff in two sections, A and B, of unequal lengths, and so formed that one section will pack into the other in combination with the links or connections, substantially as and for the purpose hereinbefore set forth.

43,085.—Post-hole Digger.—Jonathan Boone, Clintonville, Ky.:

I claim a post-hole digger having two or more cutting blades, B, attached to a common handle, A, as and for the purpose specified.

Also the combination of the pick, C, with the handle. A, and blades, B, as and for the purposes set forth.

[This invention consists in an instrument for digging post holes, provided with two or more blades or cutters attached in a position parallel to each other to a common handle or staff, in such a manner that on pushing the blades down in the ground, the earth is held between them, and on raising the instrument it raises the dirt with it, and a hole is produced just the size of the post or a little less, and if said post is driven down with a maul or siedge, it will be perfectly solid and firm without ramming.]

43,086.—Portable Screw Press.—Charles D. Brand, Oak Hill, N. Y.:

I claim, in combination with the adjustable bail, C, the fastening, H, when constructed and operating as herein described.

43,087.—Vegetable Boiler.—Clarissa Britain, St. Joseph, Mich.:

I claim, first, A vegetable boiler constructed with a perforated flange, d, surrounding its bottom edge and openings, f f, in its side, provided with a closing gate, h, substantially as and for the purposes described.

Second, The combination of annular flange, d, and detachable base block, C, with the vegetable boiler, constructed and operating substantially as herein described.

43,088.—Dish-drainer.—Clarissa Britain, St. Joseph, Mich.:

I claim, first, An apparatus for draining and drying dishes and other articles consisting of a box, A, having a perforated inclined bottom, a, and one or more partitions, c d, substantially as described.

Second, The combination of a drainer, A, with a reflecting cover, B, substantially as described.

Third, Providing the drainer, A, and a reflector, B, with detachable hinges and receiving socket portions, substantially as and for the purposes described.

Fourth, A draining and drying apparatus constructed and operating substantially as described.

43,089.—Clamp for Wringers.—Thomas Brooks, Middlefield, Conn.:

I claim the employment of the oscillating jaw, D, in combination with the screws, E, and jaws, B C, steadied in place by the orifice, G, substantially as and for the purpose described.

43,090.—Steam Trap.—Charles H. Brown, Fitchburgh, Mass.:

I claim my improved steam trap, having its single expansion tube, A, the valve opening, a, the valve c, the valve lever, D, the arm or fulcrum supporter E, and the lever operating rod, E, arranged and applied together substantially in manner so as to operate as specified.

43,091.—Article of Food and Diet from Cerealine.—James E. Brown, Philadelphia, Pa.:

I claim the procuring of cerealine from the meal of unbraned wheat, or other grains by bolting and dissolving the same, and its manufacture into articles of food and diet, substantially in the manner and for the purposes hereinabove set forth.

43,092.—Tool for boring Butter-molds.—John S. Bullard, Chagrine Falls, Ohio:

I claim the above described boring tool when constructed and applied to the purpose substantially as set forth.

43,093.—Attaching Buckles and Loops.—Lucius C. Chase Boston, Mass.:

I claim attaching loops and buckles to straps by means of the metallic plate, E, and rivets, f and g, substantially as and for the purpose described.

43,094.—Corset Fastening.—Samuel Chapman, New York City:

I claim a corset fastening arranged and applied with detachable mountings, substantially as described.

43,095.—Cider Mill.—Orlando Clarke, Rockford, Ill.:

I claim, first, The combination of two grinding disks (one or both of which has a convex, conical grinding surface) when one of said disks rotates faster than the other, to impart a rolling motion to the fruit, as herein described.

Second, The combination of the convex, conical, grinding disks, and the oblique independent shafts with the driving pinions of different sizes on the counter shaft, substantially as described, for the purpose set forth.

Third, The combination of the grinding disks and gearing with the shells, E E′, when arranged and operating as and for the purpose described.

Fourth, The combination of the disks, the gearing, the sheller, and the hopper, with the main frame, substantially in the manner described.

43,096.—Quartz-crusher.—Michael Henry Collins, Chelsea, Mass.:

I claim in my improved crushing and pulverizing mill, in which the rotary trough, wheels and breakers or crushers are arranged together and within case, H, as above described, the arrangement of each of the pulverizing wheel shafts K, and its rocker frame or shaft, L, and their journals and bearings, relatively to the said case, H, in manner substantially as explained, the said shaft, K, under such arrangement being made to project out of the case, H, and to have its journals and bearings and its rocker frame or shaft, L, and the journals and bearings thereof, disposed outside of the case, substantially as specified.

And I also claim the arrangement of the shafts, K, L, and their journals and bearings relatively to each other, as described, when disposed with respect to the case, H, and the pulverizing wheels arranged therein, substantially in manner as specified, the said shafts, K and L, under this latter arrangement, having their axes at right angles to one another.

I also claim the rotary grinding trough as made with the lip, l, arranged with respect to its wings, m m, and the receiving trough, i, disposed below the rotary trough.

43,097.—Machine for making Lamp Wick.—Joseph M. Connelly, Wheeling, West Va.:

I claim a machine constructed substantially as above described, for making tubular wicks with cotton or other filling, consisting of cutters for cutting the muslin or other fabric into strips of suitable width, the folding apparatus, and contrivance for inserting the cotton or other filling, the ironing cylinder, and the cutting rollers for severing from the wicking, thus made, pieces of proper length for wicks.

Also the mode of folding the wrapper by means of a series of folders through which the muslin or other fabric passes, having apertures so shaped as to turn up the edges and fold them over, making wrappers of uniform width, substantially as hereinbefore described.

Also, the mode, hereinbefore described, of inserting the cotton or other filling in the wick as the wrapper is being folded.

Also, the pasting apparatus consisting of a paste trough, E, guides u, rod, v, and scraper, w, for the pasting strip, constructed and arranged in relation to the folding apparatus, substantially as described.

Also, the use of a heated cylinder for ironing and drying the wick, and giving it a flattened shape.

43,098.—Suture Instrument.—Hugh M. Cooper, Xenia, Ohio:

I claim, first, the arrangement of curved shafts, A and G, guides, J J′, springs, K, K′, foot, H, finger rings, I I′, knob, B, and suture needle, D, or devices substantially equivalent; the whole being combined and operating substantially as set forth.

Second, The curved shaft, A, notched and screw threaded as described, in the described combination with nut, F, and notched suture needle, D.

43,099.—Bridge.—Albert Cottrell, Newport, R. I.:

I claim the above described combination and arrangement of the bond timbers, the balance weight supporters, the screw bolts and stretchers of the two side beams or levers, the whole constituting the half of a bridge frame, of the character specified.

43,100.—Magnet Needle threader.—Oliver Cox, Washington, D. C.:

I claim a magnetized needle threader.

43,101.—Reaping Machine.—Oliver Perry, Crawford, Wabashaw Co., Minn.:

I claim the construction, attachment, and arrangement of the hinges, b b, from which the swinging apron is suspended to receive the grain, substantially as and for the purpose described.

I also claim the construction of the apron, f, with its teeth, 9 9 9, and flanges, i i, on which the grain is received when cut by the sickle, substantially as and for the purpose described.

43,102.—Bullet Machine.—J. D. Custer, Norristown, Pa.:

I claim the combination of the turn-table, or transporting wheel, or analogous device, with the shears, the cylinder and pistons, and the automatic lathe, for the purpose of making pressed and turned bullets, substantially as described.

43,103.—Portable Railroad Switch.—Phylander Daniels, Leroy, N. Y.:

I claim the two bars, A A′, constructed as shown and provided with the clamps, B B′, in combination with the bars, C C′, G G′, either or both pairs connected to the bars, A A′, by joints and secured in position, substantially as and for the purposes set forth.

I further claim the plate F, when used in combination with the bars, A A′, C C′, for the purpose set forth.

[This invention consists in the employment or use of jointed bars, provided with clamps and fitted to the rails in such a manner that the device may be used as a temporary switch without disturbing the rails, and applied at any point, no frogs nor any other parts, except those pertaining to or forming a part of my invention, being required. The invention is also applicable to the adjusting of cars on the track, and may be applied to the rails with the greatest facility, to answer that end.]

43,104.—Spring Bed-bottom.—John and Samuel Danner, Canton, Ohio:

We claim uniting and supporting the slats by means of interposed springs, upon and within the walls of the brackets, E, which brackets are removable and replaceable at pleasure, all substantially as described and represented.

43,105.—Cupboard Latch.—Edward Doen, New Britain, Conn.:

I claim as a new improved article of manufacture a cupboard latch, substantially as shown and described.

43,106.—Plaited Shirt Bosom.—Abraham Drey, Baltimore, Md. Ante-dated June 5, 1864:

I claim uniting the surface-ridged or creased material to the shirting, or back lining of the shirt bosoms, by stitching through the creases or ridges and through the lining, substantially in the manner described.

43,107.—Plaited Shirt Bosom.—Abraham Drey, Baltimore, Md. Ante-dated June 10, 1864.:

I claim the new product for shirt bosoms, shams, etc., substantially as herein described, producing by ridging the surface material on its inner side, and fastening such ridged material in front of the ridges to a backing, substantially as set forth.

43,108.—Manufacture of Watch Keys.—George H. Fuller, Pawtucket, R. I.:

I claim making a key pipe for watch keys by the method and on the principle substantially as herein described.

43,109.—Ratchet Drill.—Henry Getty, Brooklyn, N. Y.:

I claim, first, The body, A, with its interior ring or flange, a, and recess, I, for the purposes described.

Second, The screw, C, constructed as shown, for the purpose specified.

Third, The handle, D, with its eccentrically curved recesses and projections or lips, F F, substantially as described for the purposes specified.

Fourth, The eccentric sliders, E E, constructed as shown, for the purposes specified.

43,110.—Breech-loading Ordnance.—William F. Goodwin, Powhatan, Ohio:

I claim, first, A swinging yoke or breech-piece, constructed substantially as described, with cheeks, B′, by which it is secured to the gun without requiring the employment of trunnions, screws, or bolts.

Second, In combination with the above I claim a cannon formed with an enlargement, A′, and recesses or countersinks, a, receiving and securing the ends of the yoke, and constituting the bearings on which it is oscillated, substantially as explained.

Third, The doubly-jointed swinging arms, I2 I3, for carrying the breech plug, I, and permitting the ready insertion and withdrawal of the same, substantially in the manner specified.

Fourth, The spring, i3, employed in the manner described, to close the joint at the rear of the breech plug, and loosen or expel the latter when the yoke is turned back.

Fifth, I claim the combination of the racks, E F, and loose pinion, G, for operating the swinging breech yoke, B, in the manner explained.

43,111.—Breech-loading Ordnance.—Wm. F. Goodwin, Powhatan, Ohio:

I claim, first, The swinging yoke or breech piece, B, provided with arms, b b, and concave recesses, b′ b′, fitting over the convex ends of cylindrical or partially cylindrical projections, C C, substantially as and for the purposes specified.

Second, The flanges, d d, fitting in annular grooves, c c, in the projections, C C, for preventing the spreading of the arms.

43,112.—Artificial Fuel.—Wm. Halstead, Washington, D. C., and Oliver S. Halstead, Jr., Newark, N. J.:

We claim the combination and mixture of the ingredients, in the manner and in the proportions above described.

43,113.—Clothes-dryer.—Thomas George Harold, Brooklyn, N. Y.:

I claim, first, A series of folding bars jointed to each other at the ends, and at a point nearer one end than the other of said bars, so that the frame rises when it is opened, substantially as specified.

Second, I claim the arrangement of the sustaining legs in combination with the said folding frame, as specified.

43,114.—Valve-gear for Steam Engines.—Robert Heys Philadelphia, Pa.:

I claim, first, The valve-spindle, D, of a steam engine, the link, E eccentric rod, G, and arm, F, in combination with the weighted lever k, and link, h, or their equivalents, whereby the motion of the governor-rod may be imparted to the link, as set forth for the purpose specified.

Second, The wheels, N and N′, lever, P, and pawls, e and e′, with the shield, t, when the position of the latter is regulated by the governor, and when the whole is applied to the raising and lowering of the link, E, substantially as and for the purpose herein set forth.

43,115.—Thread tension and Thread delivery in Braiding Machines.—Liveras Hull, Charlestown, Mass.:

I claim the improved thread tension and delivery mechanism, constructed substantially as explained, or in other words, as having a brake, or lever and brake, applied to the bobbin and its stand and so as to be operated by the thread and by the tension weight, substantially as specified.

43,116.—Harvester.—Stephen Hull, Poughkeepsie, N. Y.:

I claim, first, The extended braces, B B′, of the wheel frame, A, so constructed and arranged as to constitute the supports for the apron, C, and also an elevated bridge, b, for the driver's seat, substantially as described.

Second, A reciprocating reel bar which is reciprocated by a revolving eccentric axis, and itself reciprocates vertically, or nearly so, on said axis, substantially as and for the purpose described.

43,117.—Material for the manufacture of Butt Hinges, etc.—Oliver S. Judd, New Britain, Conn.:

I claim the substitution of the composition known as laminated zinc for other metals in the manufacture of butts.

43,118.—Medical Preparation.—John B. Knoebel, Shoal Creek, Ill.:

I claim the use of an antidote for "dropsy" and allied diseases, of the preparation which I term "hydropin," made substantially in the manner herein shown and described.

Also the within described composition of the ingredients above specified, and mixed together in the manner and about in the proportion set forth.

[This invention is based on the discovery that an extract prepared from the juice and seeds of sprouting cucumbers, and also the seeds of water melon, either alone or mixed with elaterium, tincture sciller and tincture colchiri, form a desirable and effective antidote against "dropsy," and other diseases of a similar nature or arising from a similar cause.]

43,119.—Washing Machine.—Joel Lee, Galesburg, Ill.:

I claim the friction roller shaft, D, cross bars, E E, friction rollers, I, rub-board frame, B, rub-board, C, washing rolls, F F, and guide grooves, H, the whole constructed and arranged substantially as and for the purposes set forth.

43,120.—Mode of treating Tanned Leather.—Benjamin H. Lightfoot, Philadelphia, Pa.:

I claim the currying or dressing of tanned leather by applying to the same crude petroleum, or any of the mineral oils, treated substantially in the manner described.

43,121.—Car Spring.—William Marshall, New York City:

I claim the combination of the springs, C D, and levers, B, arranged substantially as shown, and either with or without the box, A, to operate in the manner as and for the purpose set forth.

[This invention consists in the employment or use of spiral springs arranged and combined with levers in such a manner that a strong and durable spring will be obtained, and one which may be constructed at a very moderate cost. The object of the invention is to obtain a spring which will possess as much elasticity as the ordinary elliptic or semi-elliptic springs, and be equally as durable, and still be capable of being cheaply constructed and readily repaired when necessary. The elliptic or semi-elliptic springs although far preferable to any hitherto constructed, being too expensive for general use and applied only to the more expensive style of cars.]

43,122.—Washing Machine.—John McLaughlin, Monongahela City, Pa.:

I claim the manner of constructing and arranging the bottom of the body, a, with relation to the rubbing follower, C, that the operator is enabled by it to turn or reverse the clothes and bring all parts of them in contact with the rubbing surface of said rubbing follower, the whole being constructed, arranged, and operating in the manner herein described and set forth.

43,123.—Cultivator.—William Mettler, Frankfort, Ill.:

I claim the teeth, G G, laterally movable bodily without angular change, in combination with fixed teeth, F F, situated further behind and outward than the said movable teeth, arranged and operating substantially as and for the purpose herein specified.

I also claim the combination of the guide posts, n n, with the adjusting screws, P P, as herein set forth.

I also claim the combination of the hinged or jointed controlling braces, R R, with the guide posts, n n, and elevating device, L M M, substantially as and for the purpose herein specified.

43,124.—Pump.—John Munson, San Jose, Cal.:

I claim, first, The check or retaining valve, G, fitted in the frame, H, provided with a projection, I, and arranged in relation with the valve, F, of the piston, C, and the bolts, D, thereof or other projection attached, so as to cause both valves to be opened and remain open when the piston is at the bottom of the pump cylinder and thereby admit of the escape of the water, substantially as set forth.

Second, The hollow plunger, B, attached to the piston, C, to operate as an air-vessel or chamber, as specified.

Third, The plate, J, with the socket or brake joint, K, attached, substantially as described.

43,125.—Faucet.—Ferdinand Meyrose, St. Louis, Mo.:

I claim a faucet provided with a valve, C, attached to a horizontal stem, D, having a screw, e, on its outer part, on which a nut, E, is fitted and the latter placed and allowed to turn freely in a cylindri-

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cal chamber, f, all being arranged in connection with the two tubes, A B, substantially as described.

[This invention consists in having a valve placed or attached to a stem which is fitted horizontally in the case of the faucet or cock, and is operated by a nut so as to open and close the valve, the latter closing against its seat in a direction corresponding with the direction of the pressure of the liquid; and all so arranged that a very simple and efficient faucet or cock is obtained, and one not liable to leak, and which may be opened and closed with the greatest facility.]

### 43,126.—Letter Envelope.—Anna M. Murphy, New York City:

claim, as a new article of manufacture, an envelope letter sheet constructed with a center, c, side laps, b b', sealing lap, a, and two rows of perforations, d and e, all as herein described and for the purposes specified.

[This invention is an improvement on that class of letter envelopes on which Letters Patent have been granted to Wm. Murphy, June 2d, 1863, and the object of the same is to facilitate the operation of opening the letter without tearing it.]

### 43,127.—Furnace for heating and welding.—George Nimmo, Jersey City, N. J., and Robert S. Stanton, New York City:

We claim the combination of the heating compartment, A, with the heating and welding compartment, B, and the fire-place, C, constructed and arranged substantially as in the manner set forth and for the purposes specified.

### 43,128.—Medical Compound.—Frank H. Norton, New York City:

I claim, first, The remedy, "Anti-Diphtherion," compounded of sumach berries, alum, saltpeter, and honey, in the proportions and manner set forth.

Second, I claim the use of acetic or other acid, in combination with the materials set forth, for the purpose of preventing fermentation.

### 43,129.—Roasting Sulphurets and other Ores.—August F. W. Partz, Wurtsboro, N. Y.:

I claim, first, An upright shaft or chamber through which heat and a r are passed, in combination with a series of inclines, applied in such shaft to check the descent of the ores, as set forth.

Second, I claim a shaft in which the heat and air ascend, as the ores descend, in combination with a receiving chamber, substantially as specified.

Third, I claim a vertical shaft or chamber in which the heat and air ascend as the ores descend in combination with a door or damper for admitting a supply of air for regulating the temperature, as set forth.

### 43,130.—Stovepipe Elbow.—John G. Perry, South Kingston, R. I.:

I claim a cast-iron stovepipe knee constructed as herein described, as a new article of manufacture.

### 43,131.—Sausage-filler.—John G. Perry, South Kingston, R. I.:

I claim the combination of the nozzle and cylinder with the piston head and rod, all being constructed and arranged substantially as herein described and for the purpose set forth.

### 43,132.—Baling Press.—John W. Roberts, New Monmouth, N. J.:

I claim the combination of the levers, E E, provided with the segments, G G, in connection with the levers, D D, and with the shafts, J J, provided with bent ends, f, and connected by the arms, K K, and link, L, in the action upon the box, B, and fastenings of its doors, all substantially as described.

[This invention relates to a new and improved press for compressing substances for baling, such as hay, cotton, hops, etc. The object of the invention is to obtain a press for the purpose specified which will be very compact and occupy but little space, so that it may be operated in a building or compartment of moderate hight, and still compress substances into bales of the ordinary dimensions.]

### 43,133.—Coal-breaker.—H. C. Rogers, Scranton, Pa.:

I claim, as a new article of manufacture, the coal-breaker tooth, herein-before described, consisting of a pyramidal or tapering body, A, of soft metal, to be secured in the roller, R, by casting, and a point of steel welded in a groove in the front of the wrought-iron body, A.

[This invention consists in a coal-breaker tooth composed of iron, with a steel point inserted in such a manner that as the softer metal wears away, the harder metal is left prominent, and thus always presents a sharp point.]

### 43,134.—Sash Fastening.—Herman Rugee, Milwaukie, Wis.:

I claim the application of the lever, E, in connection with the slots, I I, in the cover, B, and the slot, H, in bolt, E, constructed in combination, operating as described, for the purposes set forth,

### 43,135.—Herbal and Scrap Book.—A. M. Safford, Springfield, Mass.:

I claim the improved herbarium, constructed and arranged substantially as herein specified.

### 43,136.—Balanced Elevator.—C. B. Sawyer, Fitchburg, Mass.:

I claim the combination and arrangement of the rope, a b c, windlass, D, pulley, H, and wheel, M, as and for the purpose described.

### 43,137.—Metal-planing Machine.—William Sellers, Philadelphia, Pa.:

I claim, first, Prov ding a rigid support for the revolving cutter head as near as possible to the cutting tools, substantially as and for the purpose specified.

Second, Traversing the revolving cutter heads, E and F, at right angles to the main supporting bed, in combination with one or more tables, G and H, when either or both the heads, E and F, and tables, G and H, can be adjusted to or from each other, substantially as described and for the purpose specified.

Third, The two revolving cutter heads having a traversing motion at right angles to the main supporting bed, A, substantially as described, when one or both of said heads has an adjustment parallel to the main supporting bed, substantially as described and for the purpose specified.

Fourth, Two or more tables, G and H, in combination with one or more cutter heads, E F, when so arranged with reference to each other as to be capable of moving in two or more directions, substantially as described.

### 43,138.—Friction Clutches or Pulleys.—H. S. Shepardson, Shelburne Falls, Mass.:

I claim, first, The combination of the wedges, h, on the sliding collar, F, with the radial arms, n, connected with the expansive or friction ring, A, substantially as and for the purpose described.

Second, I also claim connecting the radial arms, n, to the friction segments by toggle levers, o o, which straddle the cuts in said ring, as and for the purpose described.

### 43,139.—Hand Corn-planter.—Solomon S. Smith, North Fairfield, Ohio:

I claim the plunger, D, brush, C, recesses, B F and G, spring plate, I, nose, E, handles, K and N, spring, O, and stop, O', when these several parts are arranged and operating substantially as and for the purpose set forth.

### 43,140.—Furnace for desulphurizing Ores.—Charles A. Stetefeldt, New York City:

I claim, first, The employment or use of an upright terrace furnace, substantially such as herein described, for the purpose of reducing gold, silver, quicksilver and other metals from the sulphureted ores.

Second, The peculiar construction, proportion, and disposition of the terraces, L, in the shaft, K, as based on the rules deduced from the formulæ 1 to 24, whereby a complete and rapid desulphurization of the ores is accomplished.

Third, The combination of a hot-air apparatus with an upright terrace furnace, for the purpose substantially as set forth.

### 43,141.—Apparatus for purifying and refining Spirits.—Thomas Thompson, Baltimore, Md.:

I claim the apparatus described in the foregoing specification, or such an equivalent apparatus as will expose the alcohol, whiskey or other liquor to the action of the air, to refine and purify them, as described.

I claim the bone or wooden rings or their equivalents, in combination with the yarn or twine, for the purpose described.

### 43,142.—Valve for Steam Engines.—D. B. Travis, La Crosse, Wis.:

I claim the combination with two slide valves, A A, of two movable three-ported valve seats, F F, and a system of six ports in the permanent seat, the whole constructed, arranged, and operating substantially as and for the purpose herein set forth.

[This invention consists in a novel system of movable valve seats and stationary and movable ports, in combination with slide valves in a steam engine, whereby the engine is enabled to be reversed and stopped very quickly and easily.]

### 43,143.—Grate Bars.—Lorenzo B. Tupper, New York City:

I claim connecting the ends of three, four, or five of the cross bars or pieces, b, to each other as at c, for the purposes and as specified.

### 43,144.—Clothes-hanger.—Alexander J. Walker, New York City:

I claim a series of horizontally-turning hooks with arms above and below a supporting bar or strip, substantially as specified.

And in combination therewith, I claim the eyes, c c, for the purposes and as specified.

### 43,145.—Bolt for Shutters.—Thomas Warner, Germantown, Pa.:

I claim the bolt, D, its spring, e, and the projection, f, straight on one edge and rounded on the other, in combination with the plates, B and C, and their staples or their equivalents, the whole being constructed and arranged substantially as and for the purpose herein set forth.

### 43,146.—Sewing Machine.—Wm. Wickersham, Boston, Mass.:

I claim, first, Automatically raising the cloth presser foot, b, in sewing machines above the surface of the cloth of various thicknesses, in such manner that said foot shall rise higher for thick than for thin cloth, suiting the elevation to each thickness, in the manner and for the purpose described.

Second, I claim the combination in sewing machinery, of mechanism, for automatically raising the cloth-presser foot, b, variably to suit different thickness of cloth, with the feed bar, n, having merely a forward and backward motion, in the same horizontal plane, in the manner and for the purpose described.

Third, I claim attaching the looper, z, to the feed lever, h, operating in the manner and for the purpose described.

Fourth, I claim the arrangement of a sewing machine, making a double chain stitch, in which there is a main shaft above the table operating the upper needle and the presser foot, and a rocker shaft below, operating the lower needle and the feed, in the manner and for the purpose described.

Fifth, I claim operating both the feed and the looper, z, by the screw flange, g, attached to the rocker shaft, as described.

### 43,147.—Lock-fastener.—Henry S. Wilcox, West Meriden, Conn.:

I claim the rod, H, constructed as described in combination with the shank, D, key-bow, G, or their equivalents.

### 43,148.—Manufacture of Vinegar.—Henry Wittich, Baltimore, Md.:

I claim the application of starch to the liquor used in the manufacture of vinegar as a substitute for alcoholic liquor, when used substantially in the manner and for the purposes herein described.

### 43,149.—Calisthenic Pulley and Spring Cord.—John Wood, New York City:

I claim the construction and arrangement of spring cords, substantially as described, for calisthenic purposes.

### 43,150.—Tackle for Fore-and-aft Sails.—Wm. Woodbury, Gloucester, Mass.:

I claim, first, Placing the springs, b, on a rod, E, parallel to the traveler rod, C, substantially in the manner and for the purpose set forth.

Second, Forming the springs, b, in short sections with the washers, c, interposed, substantially in the manner and for the purpose set forth.

### 43,151.—Bullet Ladle.—Moses Babcock, Charlestown, Mass., assignor to James F. & E. P. Munroe, Fitchburg, Mass.:

I claim as a new article of manufacture the improved bullet ladle, made substantially as herein shown and described.

### 43,152.—Spring Clasp or Button.—Francis E. Drake (assignor to himself and George Arms), Chicopee, Mass.:

I claim a clasp or button fastening, constructed, arranged, and operating substantially in the manner described.

### 43,153.—Mode of lubricating the Bearings of Spinning Frames—Albert H. Gilman (assignor to Charles A. Shaw & himself), Biddeford, Maine:

I claim a spindle gear when so constructed that the gear itself shall form a cap for, and pass down over or around, the step without being in contact with it, substantially in the manner and for the purpose shown and described.

### 43,154.—Liquor Flask.—Robert Heneage (assignor to Reuben Dill), Buffalo, N. Y.:

I claim as a new and improved article of manufacture a liquor flask, constructed with two or more compartments and rotary nozzle, substantially as described.

### 43,155.—Reservoir Stove.—Zebulon Hunt, Hudson, N. Y., assignor to himself and Wm. J. Miller, Greenport, N. Y.:

I claim, first, Employing the circular-inclined partition or hopper, s s, for the combined purpose of forming the hot air chamber or flue, A A, of conducting the coals and ashes into the ash pan, and of preserving the brightness of the fire by shielding it from the cold air, substantially as and in the manner set forth.

Second, The shake bar, e, crank, a, and handle, b, when used in combination with the revolving grate, G, having projections on its lower edge, substantially in the manner and for the purpose set forth.

Third, The combination of fire-pot, P, with grated sides and base, suspended within the ash pit, as shown, with the fuel reservoir, B, substantially as described.

### 43,156.—Treating Oil and Fat to form Composition for Illuminating and other Purposes.—Sylvester Lewis, Rochester, N. Y., assignor to Wm. J. Williams, New York City:

I claim the treatment of oliene expressed from fats and oils with benzine, benzole, or naphtha, substantially in the proportions and on the principles set forth.

### 43,157.—Process of recovering the Acid used in refining Petroleum.—Robert G. Loftus, Chelsea, Mass., assignor to himself and Alonzo Farrar, Brookline, Mass.:

I claim the improved process as above described, of restoring the acid or separating it from its impurities or foreign matters after it may have been used in the refining of a liquid hydro-carbon or oil.

### 43,158.—India-rubber Syringe.—F. M. Shepard (assignor to himself and W. A. Shepard), New York City:

I claim as a new article of manufacture an elastic india-rubber bulb syringe in which the trimmings, i e, the valve cases and other non-elastic parts are made of vulcanite or hard rubber in contradistinction to metal of which they were heretofore made.

### 43,159.—Splitting Leather.—Caleb S. Stearns (assignor to himself and Thomas Corey), Marlboro', Mass.:

I claim the combination and arrangement of the grooved carrying roller, B, the roller, D (or its equivalent), the splitting knife, E, the bar or plate, F (or its equivalent), and the series of stripping knives, o o o.

I also claim the combination and arrangement of the grooved carrying roller, B, the roller, D, or its equivalent, the splitting knife, E, the bar or plate, F, or its equivalent, the series of stripping knives, o o o, and the roller or drum, H.

I also claim the combination of the discharger C, with the jaws, a b, the cylinder, B, the roller, D, or its equivalent, or the same and the mechanism for stripping the leather or skin, in manner as specified.

### 43,160.—Bleaching and whitening Wool, etc.—Peter Stevenson (assignor to Bigelow Carpet Company), Clinton, Mass.:

I claim the method of bleaching or whitening wool, woolen, and worsted yarns and cloth, by the combined action of oil of vitriol and aniline blue, substantially as specified.

### 43,161.—Manufacture of Toy Chairs.—Doras A. Stiles, Meriden, Conn., assignor to Merriam Manufacturing Company, Durham, Conn.:

I claim as a new improved article of manufacture a toy chair, cut in one piece of metal, substantially as and for the purpose described.

### 43,162.—Brick Machine.—Porter L. Sword & George S. Tiffany (assignors to Porter L. Sword), Adrian, Mich.:

We claim, first, Constructing the bed-plate, I, with the recess, w, and curvilinear opening in that part which forms the bottom of the cylinder, S, over the space traversed by the molds, in combination with the inclined plane, o, and wheel, T, when they are arranged to operate substantially as and for the purpose herein set forth.

Second, Supporting and adjusting in proximity to the bed-plate the mold wheel, K, by means of the wheel, P P P, and rods, a a a, as set forth.

### 43,163.—Railway Truck adapted to different Gages of Tracks.—Charles D. Tisdale, East Boston, Mass., assignor to himself and Barna W. Tisdale, Boston, Mass.:

I claim the application of the wheels to the axle by means of sleeves or tubular shafts, as described, and combining with the latter and the axle a means or mechanism for fixing the sleeves at different distances apart on the axle in order to adapt the wheels to tracks of different gages, in manner as specified.

I also claim the combination of the clutch-box, D, the flanges, G H, and the semi-circular clutch, E, the same being made and applied together and to the axle, B, and the tubular shaft or wheel sleeve, C and so as to operate substantially as specified.

I also claim the combination of the stopper, F, and the bolt, N, the two clutch-boxes, D D, and their clutches, E E, the whole being constructed and applied to and so as to operate with the axle and the wheel sleeves or hollow shafts, substantially as hereinbefore explained.

And with the wheels applied to the axle by means of sleeves or tubular shafts as described, and these latter and the axle provided with a means or mechanism for fixing the sleeves at different distances apart on the axle, and for the purpose of adapting the wheels to tracks of different gages, I claim the application of a "feather connection" (viz., the rib, a, and groove, b), or its mechanical equivalent, to one of the sleeves only of the axle, the other sleeve being free to revolve as well as to slide on the axle.

### 43,164.—Felting Machine.—Enoch Waite, South Natick, Mass., assignor to Edmond Richmond, Boston, Mass.:

I claim the combination and arrangement of an auxiliary endless apron, O, with the two main felting aprons, G H, and their felting platens, whether there be one, or more sets of platens, the whole being arranged substantially in manner and so as to operate as described.

### 43,165.—Inking Hand Stamp:—L. M. H. Fromont, Paris, France, assignor to Moritz Pinner, New York City:

I claim, first, The placing of the two concentric tubes, cylinders, or barrels, E and F, and the ascending and descending movement of these tubes, which, in drawing the die, D, give it a rotary movement, the result of which is to carry the face of the die alternately to the inking pad, C, and to the surface to be stamped, substantially as above described.

Second, The isolated position of the ink-pad, C, in the interior of the tubes, by which it is kept from intermediate contact with the hand, and consequently from the effect of its warmth, substantially as above described.

### 43,166.—Gun Cotton.—Baron W. Lenk, Vienna, Austria, assignor to Norman Rawson and Charles Richmond, Detroit, Mich.:

I claim an explosive improved gun cotton, made substantially as herein described.

### 43,167.—Steam Trap.—Hubert Joseph Vaessen, Liege, Belgium, assignor to Bernard Schaffer and Christian Budenberg, New York City:

I claim the employment or use of two valves, A B, so arranged in relation to each other and to a steam cylinder, that if said cylinder takes steam on one end by the action of the steam itself the valve communicating with said end of the cylinder is closed and the other opened and *vice versa*, and by these means the condensed water accumulating on the exhausting end of the cylinder is allowed to escape without obstruction.

[The object of this invention is to free a steam cylinder from the water condensing in the same. The invention consists in the employment or use of two valves so arranged in relation to each other and to a steam cylinder, that if said cylinder takes steam on one end by the action of the steam itself the valve communicating with said end of the cylinder will be closed by the action of the steam itself and the other opened and vice versa, and by these means the condensed water accumulating on the exhausting end of the cylinder is allowed to escape without obstruction.]

### 43,168.—Composition for lining Puddling Furnaces.—John Williams, Montreal, Canada:

I claim the within-described composition of cinder cement mixed together of the ingredients above specified, substantially in the manner and about in the proportion set forth.

### 43,169.—Composition for protecting Ship Bottoms.—W. B. Davis, Brooklyn, N. Y.:

I claim, first, The combination of carbonate of copper and arsenic, with the residuum of palm oil or tallow, after distillation, spirits of turpentine and animal oil, or their equivalents, the whole forming a composition for preventing ships, etc., from fouling, as set forth.

Second, The use of the residuum of palm oil or tallow, after distillation in combination with arsenic or with arsenic and copper compounds, in a protective composition, substantially as and for the purpose specified.

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## RE-ISSUES.

### 1,697.—Water Closet.—W. E. Parmenter and Joseph and James Grundy, West Cambridge, Mass., assignees of Thomas Grundy, deceased, late of Boston, Mass. Patented June 26, 1860:

We claim arranging a valve or plunger, or both, above the valve seat, and with reference to the inlet and outlet passages of a water-controlling device, substantially as specified, that is to say, so that either or both the valve and plunger shall be relieved or protected from the super-imposed impingement thereupon of the current passing through such a device.

### 1,698.—Harvester.—J. F. Seiberling, Doylestown, Ohio. Patented Oct. 15, 1861:

I claim discharging the completed gavel by dropping the rear end of the platform simultaneously with arresting the accumulation of the grain thereon, substantially as and for the purposes set forth.

Second, The combination of the cut-off, L, with a dropping or tilting platform, for the purpose of arresting the fall of the accumulating grain, whilst discharging the completed gavel, substantially as described.

### 1,699.—Harvester.—J. F. Seiberling, Doylestown, Ohio. Patented Oct. 15, 1861:

I claim, first, The arrangement and combination of the treadle, F, rod, U, lever, V, rod, G, and lever, H, for elevating and depressing the platform, M, substantially as set forth.

Second, In combination with the parts, F U V G & H, I claim the lever, I, and rod, K, for operating the cut-off substantially as set forth for the purpose mentioned.

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1,700.—Harvester.—J. F. Seiberling, Doylestown, Ohio. Patented Oct. 15, 1861 :

I claim, first, The slotted dropping platform, through which the stubble penetrates and seizes the gavel whilst the platform is drawn away for the purpose of discharging the grain, substantially as specified.

Second, I claim the combination of the slotted dropper, M, the cut off, L, and the finger beam, substantially as described.

1,701.—Harvester.—J. F. Seiberling, Doylestown, Ohio. Patented Oct. 15, 1861 :

I claim the arrangement of the hinged bars, Q and R, for supporting the heel of the cutter beam, and for elevating and depressing the same and the reel, by means of lever, T, or other devices, said hinged bars being used in connection with the shoe or bar, O, and its flexible attachment, substantially as set forth.

1,702.—Harvester.—J. F. Seiberling, Doylestown, Ohio. Patented Oct. 15, 1861 :

I claim a finger beam provided with a caster wheel at its outer end and a horizontally-folding hinge at its inner end, whereby said finger beam is rendered capable of folding automatically to the side of the main frame, for the purpose of transportation, substantially as set forth.

1,703.—Hoop Skirt.—Cæsar Neumann, New York City. Patented Nov. 1, 1859. Re-issued June 26, 1860 :

Iclaim a hoop skirt having its hoops supported by cords twisted or braided, either before or during the manufacture of the skirt, substantially as herein shown and described.

## DESIGNS.

1,953 to 1,956.—Carpets.—Elemir J. Ney (assignor to the Lowell Manufacturing Company), Lowell, Mass. Four patents.

1,957.—Plates of Cook's Range.—C. J. Shepard, Brooklyn, N. Y.

1,958.—Pedestal for Railroad Cars.—John Stephenson, New York City.

1,959.—Lamp Box for Railroad Cars.—John Stephenson, New York City.

1,960.—Railroad Car-step.—John Stephenson, New York City.

1,961.—Clog-hanger for Railroad Cars.—John Stephenson, New York City.

1,962.—Axle-box for Railroad Cars.—John Stephenson, New York City.

1,963.—Watch Chain—A. D. Warren (assignor to Stephen Richardson, 2d), North Attleboro', Mass.

## EXTENSION.

Spring Mattress.—W. F. Ressique, Cincinnati, Ohio, deceased, Louisa Ressique, Brooklyn, N. Y., administratrix. Patented June 10, 1850 :

I claim the construction of the jointed spring mattress, substantially as set forth in the specification.

42,686.—Pump.—Andrew J. Reynolds, Sturgis, Mich. Patented May 10. 1864. [Incorrectly reported in official list of that date] :

I claim, first, The arrangement of side pipe, C C', closed at the ends and receiving water through the two-way inlet, E, whose ports, F and F', are closed alternately by the one double-headed valve, G, substantially as set forth.

Second, The double-headed and self-emptying inlet valve, G a a' b c, the same being inserted and put together and adapted to operate in the manner set forth.

## Notes and Queries

J. W. McC., of Pa.—From the indicator card you send us your eccentric appears to have shifted. The steam comes in too soon on one side, and too late on the other. Set screws are poor security, you should put in a key. Turn the eccentric back on the shaft toward the cylinder, and you will remedy the trouble.

J. R. A., of R. I.—We have received your communication about the use of Babbitt metal on bearing surfaces, but do not think it of sufficient importance to publish. We shall be pleased to hear from you and all other mechanics on practical questions.

R. P., of N. Y.—No knife or tool will cut well if it has what is called a rounding edge. You should ask some expert to show you how to grind and sharpen an edge tool.

## Money Received.

At the Scientific American Office, on account of Patent Office business, from Wednesday, June 8, 1864, to Wednesday, June 15, 1864:—

J. D. B., of R. I., $70; P. F. D., of La., $25; R. S., of N. Y., $44; J. D. McL., of N. Y., $20; S. W., of Conn., $45; H. M., of N. J., $20; W. B., of Mass., $20; E. T. J., of Vt., $20; F. R., of N. J., $16; G. C., of Mich., $120; C. A. M., of Ill., $20; J. D., of N. Y., $20; D. G. H., of Mass., $45; A. B., of N. J., $41; J. H. C., of Pa., $36; A. H. M., of N. Y., $22; P. P., of N. H., $20; W. V., of Mich., $45; W. F., of Mass., $25; A. & B. N., of N. Y., $15; S. S. G., of Mass., $16; E. P. B., of N, Y., $16; C. W. & B., of Pa., $35; L. W., of Ill., $20; C. B., of Pa., $16; McK. & W., of Wis., $25; J. F. A., of La., $30; J. T. S., of N. Y., $16; M. F., of Conn., $16; L. W., of Conn., $40; J. G. B., of Pa., $30; H. W., of Ill., $195; W. S., of Ohio, $16; R. T. M. W., of Vt., $25; J. M. F., of Wis., $50; A. R. A., of England, $30; E. C., of N. Y., $41; S. W., of Pa., $20; P. & H., of Pa., $20; J. A., of Wis., $40; A. P., of N. Y., $20; J. K. M., of N. Y., $16; J. B., of Ohio, $20; S. & T., of Mo., $16; L. H. C., of Ill., $20; H. G., of N. Y., $16; R. R., of N. Y., $20; J. V. C. C., of Conn., $10; H. S., of N. Y., $16; E. B. C., of R. I., $20; A. T. B., of N. Y., $20; C. M., of N. Y., $25; A. J. A., of Ill., $30; R. W. G., of Ill., $47; F. & B., of Ill., $40; W. P. M., of Wis., $25; O. P. F., of N. Y., $25; A. G. W., of Cal., $15; W. R. F., of Nevada, $10; R. S. L., of Ill., $25; O. P. S., of Ill., $16; N. A., of Conn., $16; W. C., of Pa., $25; A. L. S., of Conn., $16; E. H. C., of Mich., $25; C. R. H., of Wis., $15; C. S., of N. Y., $35; E. H., of N. Y., $25; E. F., of N. Y., $25; W. B. K., of N. H., $45; C. S., of N. Y., $16; M. McM., of N. Y., $20; G. S. C., of N. Y., $21; C. T. F., of N. Y., $20; J. F., of N. J., $20; P. D., of Pa., $41; C. S., of N. Y., $10; B. M., of N. Y., $20; T. D., of N. Y., $20; J. P. E., of N. Y., $20; S. L., of Mo., $20; E. N., of N. J., $16; N. M., of Pa., $26; W. J. T., of Maine, $25; H. & S., of Pa., $16; A. W., of Ill., $16; J. T., of Wis., $25; J. B. L., of Iowa, $16; F. H., of N. Y., $25; S. & P., of Ill., $25; L. B., of La., $27; D. F. H., of Mich., $25; P. & S., of Conn., $45; W. J. L., of Mass., $16; H. M., of N. Y., $25; G. C., of Ill., $15; J. S., of Ohio, $50; H. K. J., of Conn., $16; H. L. H., of Cal., $26.

Persons having remitted money to this office will please to examine the above list to see that their initials appear in it and if they have not received an acknowledgment by mail, and their initials are not to be found in this list, they will please notify us immediately, stating the amount and how it was sent, whether by mail or express.

## Specifications and drawings and models belonging to

parties with the following initials have been forwarded to the Patent Office, from Wednesday, June 8, 1864, to Wednesday, June 15, 1864:—

J. D. B., of R. I.; P. F. D., of La.; W. W., of Conn.; E. F., of N. Y.; J. H. C., of Pa.; E. C., of N. Y.; J. G. B., of Pa.; J. O. McF., of Ill.; G. I. B., of Ind. (2 cases); J. F. A., of Wis.; L. W., of Ill.; W. J. T., of Maine; W. F., of Mass.; L. B., of La.; L. W., of Conn.; R. T. M. W., of Vt.; J. M. F., of Wis. (2 cases]; R. S., of N. Y.; A. H. M., of N. Y.; A. B., of N. J.; P. D., of Pa.; P. & S., of Conn.; A. G. W., of Cal; J. T., of Wis.; R. S. L., of Ill.; O. P. F., of N. Y.; N. M., of Pa.; W. P. M., of Wis.; McK. & W., of Wis.; E. H. C., of Mich.; C. S., of N. Y.; E. H., of N. Y.; A. R. A., of England; G. T., of Germany; B. S., of Prussia; A. I. A., of Ill.; W. C., of Pa.; D. F. H., of Mich.; S. & P., of Ill.; P. H., of N. Y.; C. M., of N. Y.; F. & B., of Ill.; W. R. F., of Nevada; H. M., of N. Y.

## Binding the "Scientific American."

It is important that all works of reference should be well bound. The SCIENTIFIC AMERICAN being the only publication in the country which records the doings of the United States Patent Office, it is preserved by a large class of its patrons, lawyers and others, for reference. Some complaints have been made that our past mode of binding in cloth is not serviceable, and a wish has been expressed that we would adopt the style of binding used on the old series, *i. e.*, heavy board sides covered with marble paper, and morocco backs and corners.

Believing that the latter style of binding will better please a large portion of our readers, we commenced on the expiration of Volume VII., to bind the sheets sent to us for the purpose in heavy board sides, covered with marble paper and leather backs and corners.

The price of binding in the above style is 75 cents. We shall be unable hereafter to furnish covers to the trade, but will be happy to receive orders for binding at the publication office, No. 37 Park Row, New York.

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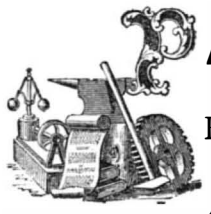

# PATENTS

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